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ABSTRACT

This task-based curriculum guide for small engine and related equipment repair is intended to help the teacher develop a classroom management system where students learn by doing. Introductory materials include a Dictionary of Occupational Titles job code and title sheet, a career ladder, a matrix relating duty/task numbers to job titles, and a task list. Each task is then outlined in this format: statement of duty, statement of task, duty and task numbers, a checklist of achievement indicators, a statement of the criteria for achievement of competence, specification of required tools and equipment and resources, and lists of teacher activities and student learning activities. The tasks are categorized by 17 duties: practicing small engine safety; practicing shop-related skills; using employability skills; using shop tools and equipment; servicing and repairing four-cycle engines, ignition systems, electrical systems, lubricating systems, fuel systems, cooling systems, starting systems, and two-cycle engines; servicing general equipment; practicing measurement; servicing and repairing motorcycles; servicing and repairing outboards; and performing engine related skills. Other contents include student and class achievement records, tool/equipment lists, and a bibliography. (YLB)

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TRADE & INDUSTRIAL EDUCATION

INTRODUCTION

The Michigan Department of Education, Vocational-Technical Education Service, has adopted descriptions and codes for vocational-technical education programs found in the document entitled, "A Classification of Instructional Programs" (C.I.P.) National Center for Educational Statistics, February, 1981. This new coding system is required of all States in reporting data on all programs receiving funds under P.L. 94-482, the Vocational Education Amendments of 1976.

The United States Office of Education (U.S.O.E.) coding system was discontinued at the conclusion of the 1981-82 school year. The 1982-83 school year was a transition year from the U.S.O.E. code system to the new C.I.P. Code system.

Michigan Secondary Trade and Industrial Education programs/courses are included in the following Classification of Instructional Program (C.I.P.) Codes.

<u>CIP</u>	<u>PROGRAM DESCRIPTOR</u>
46.000	Construction Trades
47.000	Mechanics and Repairers
48.000	Precision Production
49.000	Transportation and Material Moving

NOTE: The Trade and Industrial Education programs/courses codes not found in the above codes, but included under Michigan Trade and Industrial programs/courses are:

<u>CIP</u>	<u>PROGRAM DESCRIPTOR</u>
09.0701	Radio/T.V. General
12.0403	Cosmetology
43.0107	Law Enforcement

This Michigan Trade and Industrial Education Curriculum Guide uses the new C.I.P. program description code(s) and lists the entry level job titles associated with the occupational program area by the Dictionary of Occupational Titles (Fourth Edition, 1977), D.O.T. Code, and the Michigan Occupational Information System, (M.O.I.S.), Numerical Index code. NOTE: This information is located under Job Information with program description(s).

PROGRAM DEFINITIONS/GOALS

Vocational Education

The term "vocational education" means organized educational programs which are directly related to the preparation for paid or unpaid employment or for additional preparation for a career requiring other than a baccalaureate or advanced degree.¹

Michigan's Major Mission and Goals of Vocational-Technical Education

The delivery system of Vocational-Technical Education in Michigan will be developed around a major mission and four complementary goals.

Mission: Persons of all ages in all Michigan communities will have ready access to high quality vocational and technical education which is realistic in the light of actual or anticipated opportunities for gainful employment and consistent with their needs, interests and abilities.

Goal I: Persons with differing sex, age, racial/ethnic background, socio-economic status, academic disadvantage, economic disadvantage, limited English proficiency, physical and mental capabilities, and geographical location will have access to vocational-technical education and training or

¹The Education Amendments of 1976, Section 195(1), Public Law 94-482.

retraining and shall not be excluded from such programs because of any distinguishable personal characteristics.

Goal II: All local vocational-technical education programs will be of such quality as to assure that all students are provided learning experiences which are realistic and sufficient in light of their occupational objective.

Goal III: All prevocational/exploration, career guidance and placement programs will be coordinated with local vocational-technical education programs so that each student may make an informed and realistic occupational choice and have access to quality job placement programs.

Goal IV: All local vocational-technical education programs will be planned, monitored, and evaluated in light of actual or anticipated employment opportunities and the demand by students for programs related to their abilities and occupational objectives.

Goal V: Local, public, secondary, and postsecondary educational institutions will be responsive to the economic development and job training/retraining needs of business, industry and labor in their communities.²

Trade and Industrial Education

A vocational education curriculum that includes programs for manufacturing, construction, mechanical service, public service, health service, technical, and fisheries occupations, that prepares a person for entry level employment, upgrading or retraining in a semiskilled or skilled trade, semiprofessional or technical occupation, not generally classified

²The Annual and Long Range State Plan for Vocational Education in Michigan 1984-87.

as Agriculture, Distributive, Business or Office, in the Health profession, or Consumer/Home Economics in nature.

NOTE: The occupational clusters found within the scope of trade and industrial education include skilled or semiskilled trade, craft, or occupations which directly relate to the designing, producing, processing, assembling, maintaining, servicing, or repairing of any manufactured product.

TRADE AND INDUSTRIAL EDUCATION STUDENT ORGANIZATION

VICA

The Vocational Industrial Clubs of America (VICA) is the national organization serving trade, industrial, technical, and health occupations students in the United States. VICA incorporates leadership, citizenship, and character development programs and activities into the skill training offered in America's schools and taught by men and women who have worked in the occupational areas in which they now instruct their students.

VICA emphasizes respect for the dignity of work, high standards in trade ethics, workmanship, scholarship, and safety. VICA promotes understanding of the free enterprise system and encourages development of patriotism through the practice of democracy within the club.

Competitive activities in the trade skills as well as areas such as public speaking, job interview, parliamentary procedure and safety are vital aspects of VICA's program.

TRADE AND INDUSTRIAL EDUCATION CURRICULUM GUIDE

This Michigan Trade and Industrial Education Curriculum Guide is the result of a project funded by the Michigan State Board of Education and the Michigan Department of Education, Vocational-Technical Education Service. The project is located at Michigan State University in the College of Agri-

culture and Natural Resources' Education Institute (ANREI) and is known as the Curriculum Resource Team.

The project is directed by Dr. Chris M. Olson and Ms. Carol E. Culpepper, Faculty Specialist, Curriculum Resource Team Coordinators. They were responsible for developing the curriculum format and working with a task force leader and committee of individuals from business, industry, and education to ensure the quality of the curriculum. The development of this curriculum was monitored by Melvin France, Secondary Trade and Industrial Education Supervisor.

The names of the occupational task force leader(s) committee members, secretaries, and other support staff are acknowledged after this Introduction.

The occupational program area(s) selected for curriculum development are based on a Vocational-Technical Education Service prioritized program ranking based on employment demand, State average percent of placement, reimbursed enrollments, the number of programs, and entry level wages within the State of Michigan.

This curriculum guide was developed from the results of a statewide survey and job analysis of incumbent workers in the related occupational areas.

The curriculum guide is representative of the occupational job duty categories which list major activities and tasks performed on an entry level job. The curriculum guide contains a resource list and criteria statements which indicate the minimum standards of performance accepted as evidence of competence in completion of the task by business and industry. This is a task-based curriculum guide which helps a teacher develop a classroom management system where students learn by doing. It is based on task analysis and reflects the skills, knowledge, and attitudes that employers expect incumbent workers to possess.

The curriculum is linked to the labor market, helps the instructor open communication channels with business and industry, and manage classroom instruction where students learn "Need-to-Know" instead of "Nice-to-Know" facts.

This curriculum is adaptable for special needs/handicapped students, helps to validate the program, prepares students for entry level jobs and helps students to make career choices related to job placement.

It is the intent by all those involved in the development of this curriculum guide that it be used to provide relevant training or retraining for employment in the world of work.

The secondary occupational programs/courses in Michigan should meet the following minimum standards to assure soundness and quality of instruction:

1. The program of instruction must be based on a consideration of the skills and knowledge required in the occupation for which the instruction is being provided, and includes a planned logical sequence for those essentials of education or experience deemed necessary for the individual to meet an occupational objective.
2. The program of instruction must be developed and conducted in consultation with a Local Advisory Council/Committee which has an appropriate representation of both sexes and an appropriate representation of racial and ethnic minorities found in the program area, school, and community origin. The local advisory council will advise on current job needs, relevance of programs, and courses in meeting current job needs and consult with the local educational agency in developing program application.
3. The program of instruction will include the most up-to-date curriculum based on the competencies required in the occupation or occupational field in which the individual is being prepared, upgraded, or updated.
4. The program of instruction will be sufficiently extensive in duration and intensive within a schedule unit of time to enable the student to develop the necessary knowledge, attitudes, and skills necessary for employment in the occupation or occupational field.

5. The program of instruction will combine and coordinate related instruction with field, shop, laboratory, cooperative work, or other occupational experience which is appropriate to the vocational objective of the student, is of sufficient duration to develop competencies necessary for employment in the occupation or occupational field, and supervised, directed, or coordinated by a person qualified under the State Plan.

Facilities, equipment, and instructional materials:

1. Classrooms, libraries, shops, laboratories, and other facilities, including instructional equipment, supplies, teaching aids, and other materials will be adequate in supply and quality to meet the standards approved by the State Board so that such facilities are adequate to enable those who are to be trained to meet the occupational objective for which the education is intended.
2. If the State Board or local educational agency cannot provide adequate facilities and materials, and such are available in a business or industrial establishment, funds may be used to reimburse the local public educational agency for training programs conducted in private industry when it complies with the training standards and regulations established by the State Board. Such instruction shall be under the supervision and administration of a local public educational agency.

ACKNOWLEDGEMENT

The Michigan Trade and Industrial Curriculum Guide(s) were developed through a series of workshops held throughout the State and at Michigan State University during the 1983-84 school year.

Appreciation is given to all who have contributed their thoughts, time and energy to this curriculum project.

The Michigan Department of Education, Vocational-Technical Education Service, is indebted to the following individuals who were instrumental in the completion of this project and the development of the materials:

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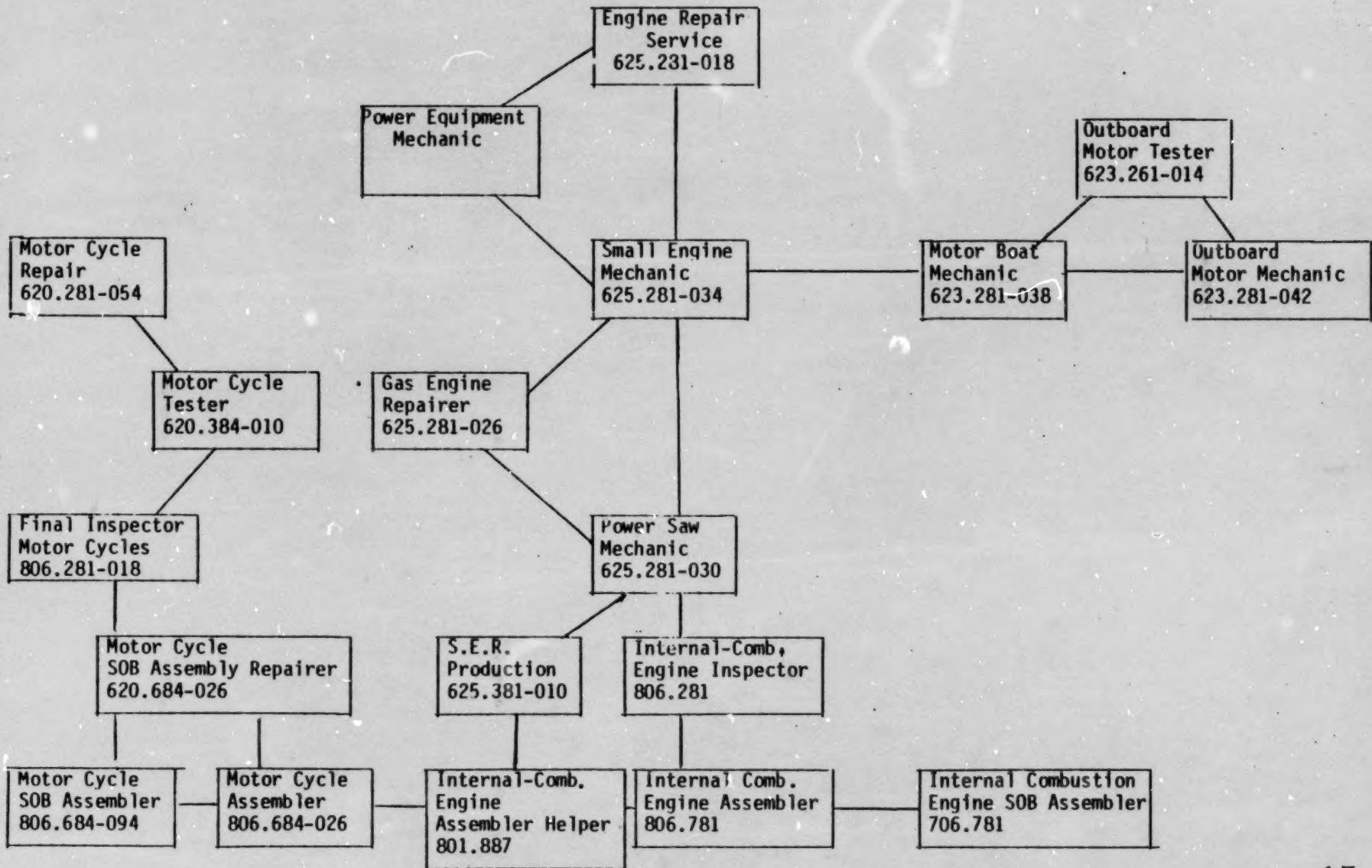
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Special recognition is also given to Michigan's employers and employees who participated in a Task Analysis Survey. They assisted with validating the curriculum by identifying job titles, tasks performed on the job and tools and equipment.

SMALL ENGINE AND RELATED EQUIPMENT REPAIR CAREER LADDER



D.O.T. JOB CODE AND TITLE SHEET

SMALL ENGINE REPAIR

<u>D.O.T. NUMBER</u>	<u>JOB TITLE</u>
625.281-034	Small Engine Mechanic
625.381-010	Small Engine Repair Production
625.281-018	Engine Repairer Service
	Power Equipment Mechanic
625.281-026	Gas Engine Repairer
625.281-030	Power Saw Mechanic
623.281-042	Outboard Motor Mechanic
* 623.281-038	Motor Boat Mechanic
* 623.261-014	Outboard Motor Tester
* 620.281-054	Motor Cycle Repairer
* 620.384-010	Motor Cycle Tester
* 806.684-090	Motor Cycle Assembler
* 806.684-094	Motor Cycle Sub Assembler
* 620.684-026	Motor Cycle Subassembly Repairer
* 806.281-018	Final Inspector, Motor Cycles
806.781-	Internal Combustion Engine Assembler
801.887	Internal Combustion Engine Assembler Helper
806.281-	Internal Combustion Engine Inspector
706.781	Internal Combustion Engine Sub Assembler

* Indicates Related Area - Utility Vehicle Repair

DUTY/TASK NUMBERS

JOB TITLES		DUTY/TASK - JOB MATRIX																				
		Small Engine Mechanic	Small Engine Repair Production Engine Repair Service	Power Equipment Mechanic	Gas Engine Repairer	Power Saw Mechanic	Outboard Motor Mechanic	Motor Boat Mechanic	Outboard Motor Tester	Motor Cycle Repairer	Motor Cycle Tester	Motor Cycle Assembler	Motor Cycle Sub Assembler	Motor Cycle Sub Assembly Repairer	Final Inspector, Motor Cycles	Internal Combustion Engine Assembler	Internal Combustion Engine Assembler Help.	Internal Combustion Engine Inspector	Internal Combustion Engine Sub Assembler			
A	1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
	2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
	3	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
	4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
	5	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
	6	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
	7	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
B	1	x		x	x	x	x	x	x	x	x											
	2	x		x	x	x	x	x	x	x	x											
	3	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
	4	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
	5	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
	6	x		x	x	x	x	x	x	x	x											
	7	x		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
D	1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
	2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
	3	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x			

DUTY/TASK NUMBERS

JOB TITLES	DUTY/TASK - JOB MATRIX																		
	Small Engine Mechanic	Small Engine Repair Production	Engine Repair Service	Power Equipment Mechanic	Gas Engine Repairer	Power Saw Mechanic	Outboard Motor Mechanic	Motor Boat Mechanic	Outboard Motor Tester	Motor Cycle Repairer	Motor Cycle Tester	Motor Cycle Assembler	Motor Cycle Sub Assembler	Motor Cycle Sub Assembly Repairer	Final Inspector, Motor Cycles	Internal Combustion Engine Assembler	Internal Combustion Engine Assembler Help	Internal Combustion Engine Inspector	Internal Combustion Engine Sub Assembler
D 4	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x
5	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x
6	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x
7	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x
8	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x
9	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
10	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x
11	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x
12	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x
13	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x
14	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x
15	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x
16	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x
17	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x
18	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x
19	x	x	x	x	x	x	x	x		x				x					
20	x	x	x	x	x	x	x	x	x	x	x			x	x			x	
21	x	x	x	x	x	x	x	x	x	x	x			x					
22	x	x	x	x	x	x	x	x	x	x	x			x					

DUTY/TASK NUMBERS

DUTY/TASK NUMBERS	JOB TITLES	DUTY/TASK - JOB MATRIX																				
		Small Engine Mechanic	Small Engine Repair Production Engine Repair Service	Power Equipment Mechanic	Gas Engine Repairer	Power Saw Mechanic	Outboard Motor Mechanic	Motor Boat Mechanic	Outboard Motor Tester	Motor Cycle Repairer	Motor Cycle Tester	Motor Cycle Assembler	Motor Cycle Sub Assembler	Motor Cycle Sub Assembly Repairer	Final Inspector, Motor Cycles	Internal Combustion Engine Assembler	Internal Combustion Engine Assembler Help	Internal Combustion Engine Inspector	Internal Combustion Engine Sub Assembler			
D23		x	x	x	x	x	x	x		x				x								
24		x	x	x	x	x	x	x		x				x								
25		x	x	x	x	x	x	x		x				x								
26		x	x	x	x	x	x	x		x				x								
27		x	x	x	x	x	x	x		x				x								
28		x	x	x	x	x	x	x		x				x								
29		x	x	x	x	x	x	x	x	x	x	x	x	x		x	x	x	x			
E 1		x	x	x	x	x	x	x	x	x	x			x	x			x				
2		x	x	x	x	x	x	x	x	x	x			x	x			x				
3		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
4		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			
5		x	x	x	x	x	x	x	x	x	x			x	x			x	x			
6		x	x	x	x	x	x	x	x	x	x			x	x			x	x			
7		x	x	x	x	x	x	x	x	x	x			x	x			x				
8		x	x	x	x	x	x	x	x	x	x			x	x			x				
9		x	x	x	x	x	x	x	x	x	x			x				x				
10		x	x	x	x	x	x	x	x	x	x			x	x			x				
11		x	x	x	x	x	x	x	x	x	x			x	x			x				

DUTY/TASK NUMBERS

JOB TITLES	DUTY/TASK - JOB MATRIX																				
	Small Engine Mechanic	Small Engine Repair Production	Engine Repair Service	Power Equipment Mechanic	Gas Engine Repairer	Power Saw Mechanic	Outboard Motor Mechanic	Motor Boat Mechanic	Outboard Motor Tester	Motor Cycle Repairer	Motor Cycle Tester	Motor Cycle Assembler	Motor Cycle Sub Assembler	Motor Cycle Sub Assembly Repairer	Final Inspector, Motor Cycles	Internal Combustion Engine Assembler	Internal Combustion Engine Assembler Help	Internal Combustion Engine Inspector	Internal Combustion Engine Sub Assembler		
E12	x	x	x	x	x	x	x	x	x	x	x			x	x			x			
13	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
14	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
15	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
16	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
17	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
18	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
19	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
21	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
22	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
23	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
24	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
25	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
26	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
27	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
28	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
29	x	x	x	x	x	x	x	x	x	x	x			x							
30	x	x	x	x	x	x	x	x	x	x	x			x							
31	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		

DUTY/TASK NUMBERS

DUTY/TASK - JOB MATRIX

JOB TITLES	Small Engine Mechanic	Small Engine Repair Production Engine Repair Service	Power Equipment Mechanic	Gas Engine Repairer	Power Saw Mechanic	Outboard Motor Mechanic	Motor Boat Mechanic	Outboard Motor Tester	Motor Cycle Repairer	Motor Cycle Tester	Motor Cycle Assembler	Motor Cycle Sub Assembler	Motor Cycle Sub Assembly Repairer	Final Inspector, Motor Cycles	Internal Combustion Engine Assembler	Internal Combustion Engine Assembler Help.	Internal Combustion Engine Inspector	Internal Combustion Engine Sub Assembler
E32	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
33	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
34	x	x	x	x	x	x	x	x	x	x			x					
35	x	x	x	x	x	x	x	x	x	x			x					
36	x	x	x	x	x	x	x	x	x	x			x					
37	x	x	x	x	x	x	x	x	x	x			x					
38	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
39	x	x	x	x	x	x	x	x	x	x			x					
40	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
41	x	x	x	x	x	x	x	x	x	x			x					
													x					
F 1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
2	x	x	x	x	x	x	x	x	x	x			x	x			x	
3	x	x	x	x	x	x	x	x	x	x			x	x			x	
4	x	x	x	x	x	x	x	x	x	x			x	x			x	
5	x	x	x	x	x	x	x	x	x	x			x	x			x	
6	x	x	x	x	x	x	x	x	x	x			x	x			x	
7	x	x	x	x	x	x	x	x	x	x			x	x			x	
8	x	x	x	x	x	x	x	x	x	x			x	x			x	
													x	x			x	

DUTY/TASK NUMBERS

DUTY/TASK - JOB MATRIX

JOB TITLES	DUTY/TASK - JOB MATRIX																		
	Small Engine Mechanic	Small Engine Repair Production Engine Repair Service	Power Equipment Mechanic	Gas Engine Repairer	Power Saw Mechanic	Outboard Motor Mechanic	Motor Boat Mechanic	Outboard Motor Tester	Motor Cycle Repairer	Motor Cycle Tester	Motor Cycle Assembler	Motor Cycle Sub Assembler	Motor Cycle Sub Assembly Repairer	Final Inspector, Motor Cycles	Internal Combustion Engine Assembler	Internal Combustion Engine Assembler Help	Internal Combustion Engine Inspector	Internal Combustion Engine Sub Assembler	
F 9	x	x	x	x	x	x	x	x	x	x			x	x			x		
10	x	x	x	x	x	x	x	x	x	x			x	x			x		
11	x	x	x	x	x	x	x	x	x	x			x	x			x		
12	x	x	x	x	x	x	x	x	x	x			x	x			x		
13	x	x	x	x	x	x	x	x	x	x			x	x			x		
14	x	x	x	x	x	x	x	x	x	x			x	x			x		
15	x	x	x	x	x	x	x	x	x	x			x	x			x		
16	x	x	x	x	x	x	x	x	x	x			x	x			x		
17	x	x	x	x	x	x	x	x	x	x			x	x			x		
18	x	x	x	x	x	x	x	x	x	x			x	x			x		
19	x	x	x	x	x	x	x		x				x						
20	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
21	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
22	x	x	x	x	x	x	x		x				x		x	x	x	x	
23	x	x	x	x	x	x	x		x					x			x		
24	x	x	x	x	x	x	x	x	x	x			x						
25	x	x	x	x	x	x	x	x	x	x			x						
26	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	

DUTY/TASK NUMBERS

DUTY/TASK NUMBERS	DUTY/TASK - JOB MATRIX																			
	JOB TITLES	Small Engine Mechanic	Small Engine Repair Production	Engine Repair Service	Power Equipment Mechanic	Gas Engine Repairer	Power Saw Mechanic	Outboard Motor Mechanic	Motor Boat Mechanic	Outboard Motor Tester	Motor Cycle Repairer	Motor Cycle Tester	Motor Cycle Assembler	Motor Cycle Sub Assembler	Motor Cycle Sub Assembly Repairer	Final Inspector, Motor Cycles	Internal Combustion Engine Assembler	Internal Combustion Engine Assembler Help	Internal Combustion Engine Inspector	Internal Combustion Engine Sub Assembler
G 1		x	x	x	x	x	x	x	x	x	x	x			x					
2		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
3		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
4		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
5		x	x	x	x	x	x	x	x	x	x	x		x						
6		x	x	x	x	x	x	x	x	x	x	x			x				x	
7		x	x	x	x	x	x	x	x	x	x	x			x				x	
8		x	x	x	x	x	x	x	x	x	x	x			x				x	
9		x	x	x	x	x	x	x	x	x	x	x			x				x	
10		x	x	x	x	x	x	x	x	x	x	x			x				x	
11		x	x	x	x	x	x	x	x	x	x	x			x				x	
12		x	x	x	x	x		x	x	x	x	x			x				x	
13		x	x	x	x	x		x	x	x	x	x			x					
14		x	x	x	x	x	x	x	x	x	x	x			x					
15		x	x	x	x	x		x	x	x	x	x			x					
16		x	x	x	x	x		x	x	x	x	x			x					
17		x	x	x	x	x		x	x	x	x	x			x					
18		x	x	x	x	x		x	x	x	x	x			x					
19		x	x	x	x	x		x	x	x	x	x			x					

DUTY/TASK NUMBERS

DUTY/TASK NUMBERS	JOB TITLES	DUTY/TASK - JOB MATRIX																			
		Small Engine Mechanic	Small Engine Repair Production Engine Repair Service	Power Equipment Mechanic	Gas Engine Repairer	Power Saw Mechanic	Outboard Motor Mechanic	Motor Boat Mechanic	Outboard Motor Tester	Motor Cycle Repairer	Motor Cycle Tester	Motor Cycle Assembler	Motor Cycle Sub Assembler	Motor Cycle Sub Assembly Repairer	Final Inspector, Motor Cycles	Internal Combustion Engine Assembler	Internal Combustion Engine Assembler Help.	Internal Combustion Engine Inspector	Internal Combustion Engine Sub Assembler		
G20		x	x	x	x	x		x	x	x	x	x			x						
21		x	x	x	x	x		x	x	x	x	x			x						
22		x	x	x	x	x		x	x	x	x	x			x						
23		x	x	x	x	x		x	x	x	x	x			x						
24		x	x	x	x	x		x	x	x	x	x			x						
25		x	x	x	x	x		x	x	x	x	x			x						
26		x	x	x	x	x		x	x	x	x	x			x						
27		x	x	x	x	x		x	x	x	x	x			x						
28		x	x	x	x	x		x	x	x	x	x			x						
29		x	x	x	x	x		x	x	x	x	x			x						
30		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
H 1		x	x	x	x	x	x	x	x	x	x				x						
2		x	x	x	x	x	x	x	x	x	x						x				
															x						
I 1		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
2		x	x	x	x	x	x	x	x	x	x				x						
3		x	x	x	x	x	x	x		x					x						
4		x	x	x	x	x	x	x		x					x						
															x						

DUTY/TASK NUMBERS

DUTY/TASK - JOB MATRIX

JOB TITLES	Small Engine Mechanic	Small Engine Repair Production Engine Repair Service	Power Equipment Mechanic	Gas Engine Repairer	Power Saw Mechanic	Outboard Motor Mechanic	Motor Boat Mechanic	Outboard Motor Tester	Motor Cycle Repairer	Motor Cycle Tester	Motor Cycle Assembler	Motor Cycle Sub Assembler	Motor Cycle Sub Assembly Repairer	Final Inspector, Motor Cycles	Internal Combustion Engine Assembler	Internal Combustion Engine Assembler Help	Internal Combustion Engine Inspector	Internal Combustion Engine Sub Assembler				
I 5	x	x	x	x	x	x	x		x				x									
6	x	x	x	x	x	x	x		x				x									
7	x	x	x	x	x	x	x		x				x									
8	x	x	x	x	x	x	x	x	x	x			x									
9	x	x	x	x	x	x	x	x	x	x			x									
10	x	x	x	x	x	x	x	x	x	x			x									
11	x	x	x	x	x	x	x	x	x	x			x									
J 1	x	x	x	x	x	x																
2	x	x	x	x	x	x			x	x												
K 1	x	x	x	x	x	x									x	x	x	x				
2	x	x	x	x	x	x																
3	x	x	x	x	x	x																
4	x	x	x	x	x	x																
5	x	x	x	x	x																	
6	x	x	x	x	x		x	x	x	x			x				x					
7	x	x	x	x	x		x	x	x	x			x				x					
8	x	x	x	x	x		x	x	x	x			x				x					

DUTY/TASK NUMBERS

JOB TITLES	DUTY/TASK - JOB MATRIX																			
	Small Engine Mechanic	Small Engine Repair Production Engine Repair Service	Power Equipment Mechanic	Gas Engine Repairer	Power Saw Mechanic	Outboard Motor Mechanic	Motor Boat Mechanic	Outboard Motor Tester	Motor Cycle Repairer	Motor Cycle Tester	Motor Cycle Assembler	Motor Cycle Sub Assembler	Motor Cycle Sub Assembly Repairer	Final Inspector, Motor Cycles	Internal Combustion Engine Assembler	Internal Combustion Engine Assembler Help	Internal Combustion Engine Inspector	Internal Combustion Engine Sub Assembler		
K 9	x	x	x	x	x		x	x	x	x	x		x							
10	x	x	x	x	x		x	x	x	x	x		x							
L 1	x	x	x	x	x	x	x	x	x	x	x		x							
2	x	x	x	x	x	x	x	x	x	x	x		x							
3	x	x	x	x	x	x	x	x	x	x	x		x							
4	x	x	x	x	x	x	x	x	x	x	x		x							
5	x	x	x	x	x	x	x	x	x	x	x		x							
6	x	x	x	x	x	x	x	x	x	x	x		x							
M 1	x	x	x	x	x															
2	x	x	x	x	x															
3	x	x	x	x	x															
4	x	x	x	x	x															
5	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
6	x	x	x	x	x															
7	x	x	x	x	x															
8	x	x	x	x	x				x	x	x	x	x							
9	x	x	x	x	x															

DUTY/TASK NUMBERS

JOB TITLES	DUTY/TASK - JOB MATRIX																		
	Small Engine Mechanic	Small Engine Repair Production Engine Repair Service	Power Equipment Mechanic	Gas Engine Repairer	Power Saw Mechanic	Outboard Motor Mechanic	Motor Boat Mechanic	Outboard Motor Tester	Motor Cycle Repairer	Motor Cycle Tester	Motor Cycle Assembler	Motor Cycle Sub Assembler	Motor Cycle Sub Assembly Repairer	Final Inspector, Motor Cycles	Internal Combustion Engine Assembler	Internal Combustion Engine Assembler Help.	Internal Combustion Engine Inspector	Internal Combustion Engine Sub Assembler	
M10	x	x	x	x	x														
11	x	x	x	x	x														
12	x	x	x	x	x	x													
13	x	x	x	x	x	x													
14	x	x	x	x	x	x													
15	x	x	x	x	x	x													
16	x	x	x	x	x	x													
17	x	x	x	x	x														
18	x	x	x	x	x														
19	x	x	x	x	x														
20	x	x	x	x	x														
21	x	x	x	x	x														
22	x	x	x	x	x				x	x	x	x	x						
23	x	x	x	x	x		x	x	x	x				x					
24	x	x	x	x	x														
25	x	x	x	x	x		x	x	x	x									
26	x	x	x	x	x														

DUTY/TASK NUMBERS

JOB TITLES	DUTY/TASK - JOB MATRIX																			
	Small Engine Mechanic	Small Engine Repair Production	Engine Repair Service	Power Equipment Mechanic	Gas Engine Repairer	Power Saw Mechanic	Outboard Motor Mechanic	Motor Boat Mechanic	Outboard Motor Tester	Motor Cycle Repairer	Motor Cycle Tester	Motor Cycle Assembler	Motor Cycle Sub Assembler	Motor Cycle Sub Assembly Repairer	Final Inspector, Motor Cycles	Internal Combustion Engine Assembler	Internal Combustion Engine Assembler Help	Internal Combustion Engine Inspector	Internal Combustion Engine Sub Assembler	
N 1	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
2	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
3	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
4	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
5	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
6	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
7	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
8	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
0 1																				
2																				
3	x	x	x	x	x					x	x	x	x	x	x					
4	x	x	x	x						x	x	x	x	x	x					
5										x	x	x	x	x	x					
6				x						x	x	x	x	x	x					
7				x						x	x	x	x	x	x					
P 1							x	x	x											
2							x	x	x											

[illegible]

DUTY/TASK NUMBERS

DUTY/TASK NUMBERS	JOB TITLES	DUTY/TASK - JOB MATRIX																		
		Small Engine Mechanic	Small Engine Repair Production Engine Repair Service	Power Equipment Mechanic	Gas Engine Repairer	Power Saw Mechanic	Outboard Motor Mechanic	Motor Boat Mechanic	Outboard Motor Tester	Motor Cycle Repairer	Motor Cycle Tester	Motor Cycle Assembler	Motor Cycle Sub Assembler	Motor Cycle Sub Assembly Repairer	Final Inspector, Motor Cycles	Internal Combustion Engine Assembler	Internal Combustion Engine Assembler Help.	Internal Combustion Engine Inspector	Internal Combustion Engine Sub Assembler	
Q11		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
12		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
13		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
14		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
15		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
16		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
17		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
18		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
19		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
20		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
21		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
22		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
23		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
24		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
25		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
26		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
27		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
28		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
29		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	

DUTY/TASK NUMBERS

DUTY/TASK NUMBERS	DUTY/TASK - JOB MATRIX																			
	JOB TITLES	Small Engine Mechanic	Small Engine Repair Production	Engine Repair Service	Power Equipment Mechanic	Gas Engine Repairer	Power Saw Mechanic	Outboard Motor Mechanic	Motor Boat Mechanic	Outboard Motor Tester	Motor Cycle Repairer	Motor Cycle Tester	Motor Cycle Assembler	Motor Cycle Sub Assembler	Motor Cycle Sub Assembly Repairer	Final Inspector, Motor Cycles	Internal Combustion Engine Assembler	Internal Combustion Engine Assembler Help.	Internal Combustion Engine Inspector	Internal Combustion Engine Sub Assembler
Q30		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
31		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
32		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
33		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
34		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
35		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
36		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
37		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
38		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
39		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
40		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
41		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
42		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
43		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
44		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
45		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
46		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
47		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
48		x	x	x	x	x	x				x	x					x	x	x	

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TASK LIST FOR
SMALL ENGINE AND
RELATED EQUIPMENT REPAIR

A. PRACTICING SMALL ENGINE SAFETY

1. Follow personal safety rules, using knowledge, to become aware of personal safety rules while performing in the small engines lab.
2. Follow safety rules on general job, using knowledge, to become aware of potential hazards while working in a small engine shop.
3. Construct a list of personal safety rules, using knowledge, to become aware of potential hazards while working on an engine.
4. Follow safety rules, using knowledge, to become aware of potential hazards while working on an engine.
5. Follow safety rules for servicing electrical systems, using knowledge, to become aware of potential hazards while working on equipment.
6. Follow safety rules for ignition system service, using knowledge, to become aware of potential hazards while working on equipment.
7. Follow safety rules for servicing the exhaust system, using knowledge, to become aware of potential hazards while working on equipment.

B. PRACTICING SHOP RELATED SKILLS

1. Write up service order, using appropriate materials, to record and maintain records of work performed.
2. Prepare a final bill, using the appropriate form, to provide the consumer with a final invoice.
3. Demonstrate operation of Master Mechanics Manual, using appropriate materials, to locate specific engine information.
4. Demonstrate operation of Master Parts Manual, using appropriate materials, to determine part number and cost.
5. Consult specification manuals, using knowledge, to become familiar with specifications used in the repair of small engines.
6. Consult parts and time guides, using knowledge, to become familiar with parts and labor charges.
7. Operate micro-fiche machine, using appropriate equipment, to read micro-fiche materials.

C. USING EMPLOYABILITY SKILLS

1. Compile an occupational profile, using reference materials, to determine the characteristics, requirements, and employment outlook of an occupation.

C. USING EMPLOYABILITY SKILLS (continued)

2. Analyze a career ladder, using available resources, to identify the opportunities for advancement that exist within the occupation.
3. Perform a job search, using information, to identify employment opportunities.
4. Investigate non-wage job characteristics, using available resources, to identify significant job factors.
5. Compile a list of personal attributes, using knowledge and information, to determine career alternatives.
6. Prepare a resume, using personal information, to apply for a job.
7. Write a letter of application, using personal notes, to apply for a job.
8. Contact an employer, using a telephone, to follow-up on a job application.
9. Complete a social security form, using information, to apply for a social security number.
10. Complete a job application, using personal notes, to apply for employment.
11. Interview for a job, using communication skills, to secure employment.
12. Develop a personal job values chart, using references, to identify acceptable job offers.
13. Demonstrate appropriate dress, using a knowledge of job requirements, to comply with standards of on-the-job attire and grooming.
14. Contact the employment interviewer, using a telephone, to accept/reject a job.
15. Complete forms, using information, to withhold city, state, and federal taxes.
16. Demonstrate interpersonal skills, using a knowledge of communication, to achieve successful relationships with others.
17. Perform a continuing education program search, using available resources, to identify opportunities for retraining, skills upgrading, and career advancement.
18. Describe job resignation/dismissal practices, using knowledge, to identify positive methods for terminating an employment situation.

D. USING SHOP TOOLS AND EQUIPMENT

1. Demonstrate use of torque wrench, using appropriate methods, to tighten a bolt or nut.

D. USING SHOP TOOLS AND EQUIPMENT (continued)

2. Measure thread sizes and styles, using appropriate materials, to identify and select appropriate thread equipment.
3. Cut threads with tap, using appropriate equipment, to restore or create new threads.
4. Cut threads with die, using appropriate equipment, to restore or create new threads.
5. Draw file a flat surface, using supplies, to restore a warped or damaged surface.
6. Cut a piece of metal with a hacksaw, using appropriate techniques, to separate metal as indicated.
7. Operate a cold chisel, using appropriate equipment, to cut a piece of flat metal.
8. Operate ignition analyzer (merc-o-tronic), using appropriate equipment, to test components of ignition systems.
9. Operate a portable tachometer, using appropriate equipment, to check engine R.P.M.
10. Operate hand drill, using appropriate equipment, to drill a hole in metal to a specific size and location.
11. Operate drill press, using appropriate equipment, to drill a hole in metal to a specific size and location.
12. Operate arbor press, using appropriate equipment, to separate two items pressed together.
13. Operate bench grinder, using appropriate equipment, to grind a piece of metal.
14. Operate valve grinder, using appropriate equipment, to grind face of valve.
15. Operate valve grinder, using appropriate equipment, to grind length of valve.
16. Operate valve seat refacer, using appropriate equipment, to restore valve seat condition.
17. Operate glass beading cleaner, using appropriate equipment, to clean metal of rust and corrosion.
18. Operate power washer, using appropriate materials, to clean equipment of dirt and grease.
19. Operate cylinder boring machine, using appropriate equipment, to bore cylinder to specified dimensions.

D. USING SHOP TOOLS AND EQUIPMENT (continued)

20. Operate dynamometer, using appropriate equipment, to test engine power under various conditions.
21. Operate spark plug cleaner/tester, using appropriate equipment, to clean and test spark plug.
22. Remove broken stud, using appropriate equipment, to replace stud and restore proper thread condition.
23. Set-up oxy-acetylene torch and assemble all components, using equipment, to ready torch for operation.
24. Light oxy-acetylene torch, using appropriate equipment, to maintain a proper flame.
25. Join metal by braze welding, using appropriate equipment, to braze weld two pieces of metal.
26. Puddle weld two metal workpieces, using appropriate equipment, to join workpieces together.
27. Operate oxy-acetylene torch, using appropriate equipment, to cut a piece of metal clean and even.
28. Sweat solder two metal surfaces, using appropriate equipment, to seal and join together.
29. Solder two wires together, using appropriate equipment, to join wires and form an electrical connection.

E. SERVICING AND REPAIRING FOUR-CYCLE ENGINES

1. Calculate engine displacement, using appropriate materials, to determine engine size.
2. Calculate compression ratio, using appropriate materials, to determine compression ratio of an engine.
3. Locate applications of small engines, using appropriate materials, to show their use and need.
4. Locate engine model and serial number, using required materials, to determine engine specifications.
5. Perform compression check, using appropriate materials, to determine engine condition.
6. Interpret compression readings, using appropriate materials, to determine engine condition.

E. SERVICING AND REPAIRING FOUR-CYCLE ENGINES (continued)

7. Perform cylinder leakage test, using appropriate equipment, to determine ring/cylinder condition.
8. Remove engine, using required tools from machine, to allow for disassembly procedure.
9. Prepare engine for disassembly, using appropriate tools, to insure safe conditions of disassembly.
10. Drain engine oil, using appropriate equipment, to remove dirt and other contaminants.
11. Disassemble four-cycle engine, using appropriate equipment, to practice disassembly procedure.
12. Clean engine, using appropriate equipment, to remove all loose dirt and oil.
13. Inspect cylinder block, using appropriate equipment, to determine wear and serviceability.
14. Inspect piston and rings, using appropriate equipment, to determine wear and serviceability.
15. Inspect connecting rod, using appropriate equipment, to determine wear and serviceability.
16. Inspect crankshaft, using appropriate equipment, to determine wear and serviceability.
17. Inspect fuel system parts, using appropriate equipment, to determine wear and serviceability.
18. Inspect valve system parts, using appropriate equipment, to determine wear and serviceability.
19. Inspect valve clearance, using appropriate equipment, to maintain operating conditions.
20. Inspect valve lifters, using appropriate equipment, to determine wear and serviceability.
21. Inspect camshaft drive gear, using appropriate equipment, to determine wear and serviceability.
22. Inspect crankcase breather assembly, using appropriate equipment, to determine operating condition.
23. Inspect engine for bent crankshaft, using appropriate equipment, to determine source of vibration.
24. Reassemble four-cycle engine, using appropriate equipment, to return engine to operating condition.

E. SERVICING AND REPAIRING FOUR-CYCLE ENGINES (continued)

25. Remove cylinder head, using appropriate tools, to inspect cylinder and head.
26. Install cylinder head, using appropriate tools, to seal combustion chamber.
27. Remove valves, using appropriate equipment, to allow for servicing and inspection.
28. Install valves, using appropriate equipment, to return valves to operating condition.
29. Replace valve guides, using appropriate equipment, to restore valve operation to manufacturer's specifications.
30. Remove flywheel, using appropriate flywheel puller, to expose ignition system.
31. Remove crankshaft bearing (ball), using appropriate equipment, to service or replace bearing.
32. Service governor systems, using appropriate equipment, to maintain operating condition.
33. Inspect flywheel key, using appropriate materials, to determine wear or damage..
34. Lap flywheel, using appropriate equipment, to re-seat.
35. Ridge ream cylinder, using appropriate equipment, to remove ridge restricting removal of piston.
36. Bore cylinder, using appropriate equipment, to resize cylinder to new specifications.
37. Hone cylinder, using appropriate equipment, to resurface cylinder to specifications.
38. Remove/install seal, using appropriate tools, to restore engine to operating condition.
39. Perform an engine tune-up, using appropriate equipment, to return engine to maximum performance.
40. Prepare engine for storage, using appropriate materials, to prevent damage to engine.
41. Service exhaust system, using appropriate equipment, to maintain operating condition.

F. SERVICING AND REPAIRING IGNITION SYSTEMS

1. Diagram ignition system, using appropriate materials, to show location of major components.
2. Inspect ignition system, using appropriate tools, to check for serviceability.
3. Inspect ignition system parts, using appropriate equipment, to determine wear and serviceability.
4. Perform a coil power test, using appropriate equipment, to determine operating amperage of coil.
5. Perform a coil high speed test, using appropriate equipment, to determine maximum output and load failure.
6. Perform coil surface insulation test, using appropriate equipment, to determine leaks in coil insulation.
7. Perform coil continuity test, using appropriate equipment, to determine continuity value.
8. Perform primary resistance test, using appropriate equipment, to determine mine value of coil primary circuit.
9. Perform coil ground test, using appropriate equipment, to determine proper grounding of coil.
10. Check condenser capacity, using appropriate equipment, to determine value.
11. Perform condenser leakage and short test, using appropriate equipment, to determine reliability of condenser.
12. Perform condenser series resistance test, using appropriate equipment, to determine reliability of condenser.
13. Measure resistance of breaker points, using appropriate equipment, to determine resistance and wearability of points.
14. Test spark plug wire, using appropriate equipment, to detect outside of specifications.
15. Inspect ignition timing, using appropriate materials, to determine setting (stator plate style).
16. Test ignition timing, using appropriate equipment, to detect any deviation of setting.
17. Adjust ignition timing, using appropriate equipment, to restore ignition timing to manufacturer's specifications.

F. SERVICING AND REPAIRING IGNITION SYSTEMS (continued)

18. Inspect breaker cam, using appropriate materials, to determine wear and serviceability.
19. Inspect breaker plunger, using appropriate materials, to check for wear and serviceability.
20. Replace condenser, using appropriate equipment, to restore condenser operation.
21. Replace ignition points, using appropriate equipment, to restore point operation.
22. Adjust air gap magneto to flywheel, using appropriate tools, to maintain operating condition.
23. Inspect condition of spark plugs, using appropriate materials, to determine engine operating condition.
24. Clean spark plugs, using appropriate equipment, to remove all carbon from electrode insulator and shell.
25. Gap spark plugs, using appropriate equipment, to set electrode gap.
26. Replace spark plugs, using appropriate equipment, to restore spark plug operation.

G. SERVICING AND REPAIRING ELECTRICAL SYSTEMS

1. Solve equations involving Ohm's Law, using appropriate materials, to find amperes, volts or ohms.
2. Locate electrical symbols, using appropriate materials, to identify electrical parts on a schematic.
3. Wire a series circuit, using appropriate materials, to identify and isolate paths of current.
4. Wire a parallel circuit, using appropriate materials, to identify and isolate paths of current.
5. Replace light bulbs, using appropriate equipment, to restore light bulbs.
6. Replace bulb sockets, using appropriate equipment, to restore bulb socket operation.
7. Test switches, using appropriate equipment, to detect resistance outside of specifications.
8. Replace switches, using appropriate equipment, to restore switch operation.
9. Test fuses, using appropriate equipment, to detect open fuses.

G. SERVICING AND REPAIRING ELECTRICAL SYSTEMS

10. Replace fuses, using appropriate equipment, to restore fuse operation.
11. Construct a circuit with a fuse, using appropriate materials, to protect the components of the circuit from overload.
12. Construct a circuit with an ammeter, using appropriate equipment, to measure current flow and load upon the circuit.
13. Construct a circuit with a switch, using appropriate materials, to turn a light on and off.
14. Bypass a switch, using appropriate materials, to determine possible switch failure.
15. Test battery, using hydrometer, to detect any cell with specific gravity less than 1.220.
16. Test battery electrolyte level, using appropriate equipment, to detect any deviation from manufacturer's specifications.
17. Test battery voltage, using appropriate equipment, to detect a low voltage condition.
18. Test battery capacity (load), using appropriate equipment, to detect any deviation from manufacturer's specifications.
19. Test battery for surface leakage, using appropriate equipment, to detect any deviation from manufacturer's specifications.
20. Charge battery, using appropriate equipment, to restore battery charge.
21. Clean battery post and cable connections, using appropriate equipment, to remove corrosion and foreign material.
22. Replace battery cables, using appropriate equipment, to restore battery cable operation.
23. Replace instrument gauges, using appropriate equipment, to restore instrument gauge operation.
24. Replace constant voltage regulator, using appropriate equipment, to restore constant voltage regulator operation.
25. Measure voltage in a circuit, using appropriate equipment, to determine current flow.
26. Measure resistance of a circuit, using appropriate equipment, to determine circuit performance.
27. Test ground system resistance, using appropriate equipment, to detect resistance in the circuit.

G. SERVICING AND REPAIRING ELECTRICAL SYSTEMS (continued)

28. Test charging system output, using appropriate equipment, to detect any deviation from manufacturer's specifications for output.
29. Test constant voltage regulator, using appropriate equipment, to detect operation outside manufacturer's specifications.
30. Test instrument gauges, using appropriate equipment, to detect operation outside manufacturer's specifications.
31. Adjust voltage regulator, using appropriate materials, to maintain safe operating condition.

H. SERVICING AND REPAIRING LUBRICATING SYSTEMS

1. Locate oil A.P.I. and S.A.E. codes, using appropriate materials, to identify basic oil types.
2. Change engine oil, using required tools, to inspect and replenish with fresh lubricant.

I. SERVICING AND REPAIRING FUEL SYSTEMS

1. Follow safety precautions for gasoline, using appropriate materials, to prevent and avoid fires.
2. Disassemble a horizontal float feed carburetor, using appropriate equipment, to inspect and identify parts.
3. Assemble a horizontal float feed carburetor, using appropriate equipment, to restore to operating condition.
4. Disassemble suction feed carburetor, using appropriate equipment, to inspect and identify parts.
5. Assemble suction feed carburetor, using appropriate equipment, to restore to operating condition.
6. Disassemble diaphragm carburetor, using appropriate equipment, to inspect and identify parts.
7. Assemble diaphragm carburetor, using appropriate equipment, to restore to operating condition.
8. Rebuild carburetor, using appropriate equipment, to restore carburetor operation.
9. Clean carburetor air cleaner, using appropriate equipment, to restore air cleaner operation.
10. Test fuel pump, using appropriate equipment, to detect deviations in pressure, volume or vacuum readings.

I. SERVICING AND REPAIRING FUEL SYSTEMS (continued)

11. Adjust automatic choke, using appropriate equipment, to restore choke operation.

J. SERVICING AND REPAIRING COOLING SYSTEMS

1. Remove blower housing, using appropriate equipment, to inspect for proper operation.
2. Service air cooling system, using appropriate equipment, to maintain operating condition.

K. SERVICING AND REPAIRING STARTING SYSTEMS

1. Inspect recoil starter, using appropriate equipment, to determine wear and serviceability.
2. Remove recoil assembly, using appropriate tools, to inspect for proper operation.
3. Install rope in recoil, using appropriate tools, to inspect for proper
4. Replace recoil spring, using appropriate equipment, to restore operation.
5. Service Briggs and Stratton strater clutch, using appropriate equipment, to maintain operating condition.
6. Check operation of electric starters, using appropriate materials, to explain functions and parts.
7. Test starter control circuit, using appropriate equipment, to detect malfunctioning component.
8. Test starter current draw, using appropriate equipment, to detect current draw that exceeds specifications.
9. Replace starter solenoid, using appropriate equipment, to restore starter solenoid operation.
10. Replace starter, using appropriate equipment, to restore starter operation.

L. SERVICING AND REPAIRING TWO-CYCLE ENGINES

1. Disassemble two-cycle engines, using appropriate tools, to inspect for wear and serviceability.
2. Inspect reed valve, using appropriate materials, to check for proper operation.

L. SERVICING AND REPAIRING TWO-CYCLE ENGINES (continued)

3. Inspect rotary valve, using appropriate materials, to check for proper operation.
4. Reassemble two-cycle engine, using appropriate equipment, to return engine to operating condition.
5. Mix fuel supply, using appropriate equipment, to prepare engine for operation.
6. Pressure test engine crankcase, using appropriate materials, to determine leakage.

M. SERVICING GENERAL EQUIPMENT SERVICE

1. Service auxiliary drive units, using appropriate equipment, to maintain operating condition.
2. Service differential, using appropriate equipment, to maintain operating condition.
3. Service lawnmower blade, using appropriate equipment, to maintain operating condition.
4. Service rotary mower body, using appropriate equipment, to maintain operating condition.
5. Adjust throttle control, using appropriate equipment, to maintain operating condition.
6. Service riding mower front axle, using appropriate equipment, to maintain operating condition.
7. Adjust band axle brakes, using appropriate equipment, to maintain operating condition.
8. Adjust clutch linkage, using appropriate equipment, to maintain operating condition.
9. Service roto-tiller tines, using appropriate equipment, to maintain operating condition.
10. Service roto-tiller gear box, using appropriate equipment, to maintain operating condition.
11. Service gas powered lawn edger, using appropriate equipment, to maintain operating condition.
12. Remove chain saw, using appropriate equipment, to inspect chain.
13. Adjust chain saw tension, using appropriate tools, to maintain and increase chain life.

M. SERVICING GENERAL EQUIPMENT SERVICE (continued)

14. Inspect chain saw bar, using appropriate materials, to locate possible damage and wear.
15. Service chain saw clutch, using appropriate equipment, to maintain operating condition.
16. Sharpen chain saw, using appropriate equipment, to restore cutting condition.
17. Service snowmobile track, using appropriate equipment, to maintain operating condition.
18. Service torque convertor of snowmobile, using appropriate equipment, to maintain operating condition.
19. Service snowmobile skis, using appropriate equipment, to maintain operating condition.
20. Review designs of snow throwers, using appropriate equipment, to identify and explain functions.
21. Service snow thrower, using appropriate equipment, to maintain operating condition.
22. Repack wheel bearings, using appropriate equipment, to maintain operating condition.
23. Jump start a machine with a dead battery, using appropriate equipment, to return the machine to operating condition.
24. Service weed eater, using appropriate equipment, to maintain operating condition.
25. Service micro-safety switches, using appropriate equipment, to maintain operating condition.
26. Service blade brake mechanisms, using appropriate equipment, to test for safe operating condition.

N. PRACTICING MEASUREMENT

1. Demonstrate measuring skills, using a standard 12" ruler, to determine size to the nearest 1/16 of an inch.
2. Demonstrate measuring skills, using an outside micrometer, to measure outside dimensions within .001.
3. Demonstrate measuring skills, using Vernier Calipers, to measure several selected pieces of metal to within .001 of an inch.
4. Demonstrate measuring skills, using telescope gauges, to measure bore of a cylinder within .001 of an inch.

N. PRACTICING MEASUREMENT

5. Demonstrate measuring skills, using a depth micrometer, to measure the depth of a recessed surface to within .001.
6. Demonstrate measuring skills, using a dial indicator, to measure piston travel.
7. Demonstrate measuring skills, using a dial indicator, to measure "run out" of a centered object.
8. Demonstrate measuring skills, using a bore gauge, to measure the bore of a cylinder.

O. SERVICING AND REPAIRING MOTORCYCLES

1. Service "wet clutch", using appropriate equipment, to maintain operating condition.
2. Service front suspension, using appropriate equipment, to maintain operating condition.
3. Service chain, using appropriate equipment, to maintain operating condition.
4. Service tire, using appropriate equipment, to maintain operating condition.
5. Service wire wheels, using appropriate equipment, to maintain operating condition.
6. Service drum brakes, using appropriate equipment, to maintain operating condition.
7. Service hydraulic brake systems, using appropriate equipment, to maintain operating condition.

P. SERVICING AND REPAIRING OUTBOARDS

1. Perform preseason preparation of outboard engine, using appropriate equipment, to prepare engine for use.
2. Perform midseason service of outboard engine, using appropriate equipment, to maintain operating condition.
3. Perform offseason storage service of outboard engine, using appropriate materials, to prevent damage of rust and corrosion.
4. Remove power head of outboard engine, using appropriate equipment, to gain access to engine parts and lower unit.
5. Remove lower unit assembly of outboard, using appropriate equipment, to gain access to internal parts.

P. SERVICING AND REPAIRING OUTBOARDS (continued)

6. Replace water pump impeller of outboard, using appropriate equipment, to restore operating condition.
7. Disassemble lower gear box of outboard, using appropriate equipment, to inspect parts for wear and damage.

Q. PERFORMING ENGINE RELATED SKILLS

1. Review general mechanics tools, using appropriate methods, to demonstrate a basic knowledge of use.
2. Review soldering, using appropriate materials, to join wires or electrical connections.
3. Review general terms of simple machines, using appropriate materials, to explain each term.
4. Review terms associated with development of power, using appropriate materials, to define each.
5. Review the theory of operation of a four-cycle engine, using appropriate materials, to show understanding of operation.
6. Review horsepower, using appropriate materials, to explain different forms and calculations of each.
7. Review piston, using appropriate materials, to explain operation and functions.
8. Review piston rings, using appropriate materials, to explain operation.
9. Review function of connecting rod, using appropriate materials, to explain operation.
10. Review functions of a cylinder, using appropriate materials, to explain operation.
11. Review operation of a crankshaft, using appropriate materials, to explain functions.
12. Review lubrication system, using appropriate materials, to explain operation and functions.
13. Review the operation of camshaft, using appropriate materials, to explain functions.
14. Review camshaft drive gear, using appropriate materials, to explain operation and function.
15. Review valve lifters (tappets), using appropriate materials, to explain operation and functions.

Q. PERFORMING ENGINE RELATED SKILLS (continued)

16. Review valves, using appropriate materials, to explain operation and functions.
17. Review operation of flywheel, using appropriate materials, to explain functions.
18. Review operation of intake manifold, using appropriate materials, to explain functions.
19. Locate common physical defects of metal, using appropriate materials, to describe each term.
20. Review styles of bearings, using appropriate equipment, to select service procedures.
21. Review procedure for servicing engine seals, using appropriate materials, to restore seals to manufacturer's specifications.
22. Review procedure for performing an engine tune-up, using appropriate materials, to return engine to maximum performance.
23. Review basic operation of ignition system, using appropriate materials, to explain basic function.
24. Review operation of solid state ignition system, using appropriate materials, to explain functions and operation.
25. Review the operation of breaker points, using appropriate materials, to explain basic functions.
26. Review the operation of megneto, using appropriate materials, to explain basic function.
27. Review the operation of condenser, using appropriate materials, to explain basic function.
28. Review the basic operation of a coil, using appropriate materials, to explain basic functions.
29. Review the basic operation of a spark plug, using appropriate materials, to explain basic functions.
30. Review general terms of electricity, using appropriate materials, to define each term.
31. Review wire size, using appropriate materials, to determine correct size for application.
32. Label parts of a wet cell battery, using appropriate materials, to identify and explain operation.
33. Review lubrication systems, using appropriate materials, to explain operation and function.

Q. PERFORMING ENGINE RELATED SKILLS (continued)

34. Review general terms of carburetion, using appropriate materials, to define each term.
35. Review gasoline as a fuel, using appropriate materials, to explain its characteristics, properties, and the manufacture of.
36. Review carburetor styles, using appropriate materials, to identify basic characteristics.
37. Review feed systems, using appropriate materials, to explain methods of gasoline delivery to carburetor.
38. Review basic principles of exhaust systems, using appropriate materials, to explain functions.
39. Review basic principles of air cooling system, using appropriate materials, to explain functions.
40. Review styles of mechanical starters, using appropriate materials, to identify unit.
41. Review theory of operation of a loop-scavenged two-cycle engine, using appropriate materials, to demonstrate an awareness of operation.
42. Review theory of operation of a cross-flow two-cycle engine, using appropriate materials, to demonstrate an awareness of operation.
43. Compare two-cycle and four-cycle engine, using appropriate materials, to show advantages and disadvantages of each.
44. Review styles of drive systems, using appropriate materials, to identify and demonstrate an awareness of operation.
45. Review operation of outside micrometer, using appropriate materials, to understand care and usage.
46. Review metric system, using appropriate materials, to compare to English measurement system.
47. Review water cooling system of outboard, using appropriate materials, to identify parts, location and functions.
48. Review theory of operation of a rotary engine, using appropriate materials, to demonstrate an awareness of operation.
49. Review advantages and disadvantages of a rotary engine, using appropriate materials, to determine applications.
50. Review basic parts of a rotary engine, using appropriate materials, to explain basic functions.

Q. PERFORMING ENGINE RELATED SKILLS

51. Review troubleshooting procedure, using appropriate materials, to locate and isolate malfunction.

Duty: Practicing Small Engine Safety		Duty No. A	
		Task No. 1	
Task: Follow personal safety rules, using knowledge, to become aware of personal safety rules while performing in the small engines lab.			
Achievement Indicators:	The learner:	Yes	No
1. Wore eye protection at correct times -		_____	_____
2. Removed rings and other jewelry -		_____	_____
3. Wore proper apparel for the job being performed -		_____	_____
4. Demonstrated a basic knowledge of safety -		_____	_____
5. Demonstrated basic knowledge of emergency procedures -		_____	_____
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to instructions.			
Tools and Equipment:	Resources:		

Teacher Activities	Student Learning Activities
1. Present lecture on shop safety rules. 2. Use "ABC" Handtool Text for reference. 3. Demonstrate shop safety by examples in room. 4. Administer test related to task and evaluate. 5. Cover items commonly missed.	1. Listen to lecture on shop safety. 2. Read "ABC" of Handtools. 3. Discuss safety rules from text and lecture. 4. Take test to show understanding of safety. 5. Demonstrate by following shop safety rules.

Duty: Practicing Small Engine Safety		Duty No. A																									
		Task No. 2																									
Task: Follow safety rules on general job, using knowledge, to become aware of potential hazards while working in a small engine shop.																											
<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; width: 35%;">Achievement Indicators:</th> <th style="text-align: left; width: 35%;">The learner:</th> <th style="text-align: center; width: 15%;">Yes</th> <th style="text-align: center; width: 15%;">No</th> </tr> </thead> <tbody> <tr> <td>1. Followed all basic shop safety rules as apply to setting -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>2. Conducted an inspection of shop area locating potential hazards -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>3. Completed a safety inspection check list -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>4. Made a list of recommendations as to improve safety conditions -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>5. Reported all unsafe conditions to proper person -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed all basic shop safety rules as apply to setting -		_____	_____	2. Conducted an inspection of shop area locating potential hazards -		_____	_____	3. Completed a safety inspection check list -		_____	_____	4. Made a list of recommendations as to improve safety conditions -		_____	_____	5. Reported all unsafe conditions to proper person -		_____	_____
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to instructions.																											
Tools and Equipment:		Resources:																									

Duty: Practicing Small Engine Safety

Duty No. A

Task No. 3

Task: Construct a list of personal safety rules, using knowledge, to become aware of potential hazards while working on an engine.

Achievement Indicators:	The learner:	Yes	No
1. Followed safety rules regarding fire safety -		_____	_____
2. Followed safety rules regarding pinch points, cuts and bruises -		_____	_____
3. Followed safety rules for prevention of electrical shock -		_____	_____
4. Followed safety rules regarding ventilation -		_____	_____
5. Followed safety rules regarding the use and care of hand tools -		_____	_____
6. Followed safety rules regarding use of power tools -		_____	_____
7. Followed safety rules regarding clothing in a shop setting -		_____	_____
8. Followed safety rules regarding burns from heat and chemicals -		_____	_____
9. Followed safety rules on the operation of power driven equipment -		_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to instructions.

Tools and Equipment:

Resources:

Duty: Practicing Small Engine Safety		Duty No. A																																													
		Task No. 4																																													
Task: Follow safety rules, using knowledge, to become aware of potential hazards while working on an engine.																																															
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Listed safety rules for other workers in area -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Listed safety rules for equipment used in diagnosing the engine -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Listed sources of potential electrical shock -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Listed potential fire hazards -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Kept hands and feet clear of operating machine/engine -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Listed sources of potential pinch points for cuts and bruises -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>8. Listed methods of providing proper ventilation -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>9. Listed sources of carbon monoxide poisoning -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>10. Listed sources of potential hazards while diagnosing the engine as required by the type of equipment -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Listed safety rules for other workers in area -		_____	_____	3. Listed safety rules for equipment used in diagnosing the engine -		_____	_____	4. Listed sources of potential electrical shock -		_____	_____	5. Listed potential fire hazards -		_____	_____	6. Kept hands and feet clear of operating machine/engine -		_____	_____	7. Listed sources of potential pinch points for cuts and bruises -		_____	_____	8. Listed methods of providing proper ventilation -		_____	_____	9. Listed sources of carbon monoxide poisoning -		_____	_____	10. Listed sources of potential hazards while diagnosing the engine as required by the type of equipment -		_____	_____
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Duty: Practicing Small Engine Safety		Duty No. A																																	
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Task: Follow safety rules for servicing electrical systems, using knowledge, to become aware of potential hazards while working on equipment.																																			
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Duty: Practicing Small Engine Safety		Duty No. A																																	
		Task No. 6																																	
Task: Follow safety rules for ignition system service, using knowledge, to become aware of potential hazards while working on equipment.																																			
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Listed safety rules for power and hand tool use -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Listed safety rules for equipment used in servicing the ignition system -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Listed sources of potential electrical shock -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Listed sources of potential fire hazards -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Listed sources of potential pinch points for cuts and bruises -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Listed sources of potential hazards while servicing the components of the ignition system -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Listed safety rules for power and hand tool use -		_____	_____	3. Listed safety rules for equipment used in servicing the ignition system -		_____	_____	4. Listed sources of potential electrical shock -		_____	_____	5. Listed sources of potential fire hazards -		_____	_____	6. Listed sources of potential pinch points for cuts and bruises -		_____	_____	7. Listed sources of potential hazards while servicing the components of the ignition system -		_____	_____
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Tools and Equipment:	Resources:																																		

Duty: Practicing Small Engine Safety**Duty No.** A**Task No.** 7**Task:** Follow safety rules for servicing the exhaust system, using knowledge, to become aware of potential hazards while working on equipment.**Achievement Indicators:**

The learner:

Yes

No

1. Listed sources for potential burns -
2. Listed methods for proper ventilation -
3. Listed sources of carbon monoxide poisoning -
4. Listed sources of potential fire hazards -
5. Followed personal safety rules -

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to instructions.**Tools and Equipment:****Resources:**

Duty: Practicing Shop Related Skills		Duty No. B																																									
		Task No. 1																																									
Task: Write up service order, using appropriate materials, to record and maintain records of work performed.																																											
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Filled in customer's name and address -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Recorded model and serial number -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Recorded customer's request for service or repair -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Provided estimate of repairs -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Tagged item with repair ticket -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Recorded all parts used, part numbers and cost of each -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Recorded labor time and charges -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>8. Computed total cost -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>9. Notified customer of work completion -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Filled in customer's name and address -		_____	_____	2. Recorded model and serial number -		_____	_____	3. Recorded customer's request for service or repair -		_____	_____	4. Provided estimate of repairs -		_____	_____	5. Tagged item with repair ticket -		_____	_____	6. Recorded all parts used, part numbers and cost of each -		_____	_____	7. Recorded labor time and charges -		_____	_____	8. Computed total cost -		_____	_____	9. Notified customer of work completion -		_____	_____
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Tools and Equipment:		Resources:																																									

Teacher Activities	Student Learning Activities
1. Handout copy of service order. 2. Take students through "mock" up of service order. 3. Provide each with opportunity to write up an actual service order.	1. Obtain copy of service order. 2. Fill out practice service order. 3. Fill out actual service order. 76

Duty: Practicing Shop Related Skills		Duty No. B																													
		Task No. 2																													
Task: Prepare a final bill, using the appropriate form, to provide the consumer with a final invoice.																															
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Received sample final bill -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Listed description and price of all parts (stated if parts were used, rebuilt or reconditioned) -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Stated actual price of labor for work performed -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Stated total labor charged -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Stated all work performed for which there is a charge -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Obtained signature of authorized representative of repair facility -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Received sample final bill -		_____	_____	2. Listed description and price of all parts (stated if parts were used, rebuilt or reconditioned) -		_____	_____	3. Stated actual price of labor for work performed -		_____	_____	4. Stated total labor charged -		_____	_____	5. Stated all work performed for which there is a charge -		_____	_____	6. Obtained signature of authorized representative of repair facility -		_____	_____
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Duty: Practicing Shop Related Skills		Duty No. B																					
		Task No. 3																					
Task: Demonstrate operation of Master Mechanics Manual, using appropriate materials, to locate specific engine information.																							
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Duty: Practicing Shop Related Skills		Duty No. B																								
		Task No. 4																								
Task: Demonstrate operation of Master Parts Manual, using appropriate materials, to determine part number and cost.																										
Achievement Indicators:	The learner:	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: center;">Yes</th> <th style="width: 50%; text-align: center;">No</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> </tbody> </table>	Yes	No	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
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Duty: Practicing Shop Related Skills		Duty No. 8																	
		Task No. 5																	
Task: Consult specification manuals, using knowledge, to become familiar with specifications used in the repair of small engines.																			
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Obtained a specification worksheet -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Obtained the proper small engine repair manual -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Completed the specification worksheet on a particular machine -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Obtained a specification worksheet -		_____	_____	2. Obtained the proper small engine repair manual -		_____	_____	3. Completed the specification worksheet on a particular machine -		_____	_____
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		Task No. 6																					
Task: Consult parts and time guides. using knowledge, to become familiar with parts and labor charges.																							
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Obtained parts and time guides -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Listed all parts, numbers and prices for a minor tune-up on a particular machine -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Listed flat rate time for completing a minor tune-up on a particular machine -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Computed total cost of parts and labor -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Obtained parts and time guides -		_____	_____	2. Listed all parts, numbers and prices for a minor tune-up on a particular machine -		_____	_____	3. Listed flat rate time for completing a minor tune-up on a particular machine -		_____	_____	4. Computed total cost of parts and labor -		_____	_____
Achievement Indicators:	The learner:	Yes	No																				
1. Obtained parts and time guides -		_____	_____																				
2. Listed all parts, numbers and prices for a minor tune-up on a particular machine -		_____	_____																				
3. Listed flat rate time for completing a minor tune-up on a particular machine -		_____	_____																				
4. Computed total cost of parts and labor -		_____	_____																				
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to instructions																							
Tools and Equipment:	Resources:																						

Duty: Practicing Shop Related Skills

Duty No. B

Task No. 7

Task: Operate micro-fiche machine, using appropriate equipment, to read micro-fiche materials.

Achievement Indicators:	The learner:	Yes	No
1. Listed personal safety rules -		_____	_____
2. Listed equipment safety rules -		_____	_____
3. Selected fiche card to be read -		_____	_____
4. Located card in holder -		_____	_____
5. Operated controls to locate desired page -		_____	_____
6. Read materials -		_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Using Employability Skills		Duty No. C	
		Task No. 1	
Task: Compile an occupational profile, using reference materials, to determine the characteristics, requirements, and employment outlook of an occupation.			
Achievement Indicators: 1. Described: a. main job duties - b. places of employment - c. physical demands - d. working (environmental) conditions - e. educational requirements - f. wage and fringe benefit information - g. local, regional and national employment outlook -	The learner:	Yes	No
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to the satisfaction of the supervisor.			
Tools and Equipment:	Resources: Michigan Occupational Information System (M.O.I.S.)		

Duty: Using Employability Skills		Duty No. C Task No. 2	
Task: Analyze a career ladder, using available resources, to identify the opportunities for advancement that exist within the occupation.			
Achievement Indicators:		The learner:	
		Yes	No
1. Described the career ladder associated with the appropriate occupational area:			
a. Listed jobs, entry through advanced levels -		_____	_____
b. Gave examples of tasks that employees in the occupation are required to perform -		_____	_____
c. Identified tools/equipment that employees in the occupation use -		_____	_____
d. Made reference to the relationship of the job(s) to data, people, things -		_____	_____
e. Made reference to education and/or on-the-job training needed to attain career mobility -		_____	_____
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to the satisfaction of the supervisor.			
Tools and Equipment:		Resources: Dictionary of Occupational Titles (D.O.T.) Michigan Occupational Information System (M.O.I.S.)	

Duty: Using Employability Skills		Duty No. C																				
		Task No. 3																				
Task: Perform a job search, using information, to identify employment opportunities.																						
<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; width: 50%;">Achievement Indicators:</th> <th style="text-align: left; width: 30%;">The learner:</th> <th style="text-align: center; width: 10%;">Yes</th> <th style="text-align: center; width: 10%;">No</th> </tr> </thead> <tbody> <tr> <td>1. Determined geographic boundaries for job search -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>2. Listed types of potential places of employment -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>3. Developed a list of prime sources of information concerning opportunities for employment--advertised and unadvertised -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>4. Gathered information about advertised and unadvertised job openings -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> </tbody> </table>			Achievement Indicators:	The learner:	Yes	No	1. Determined geographic boundaries for job search -		_____	_____	2. Listed types of potential places of employment -		_____	_____	3. Developed a list of prime sources of information concerning opportunities for employment--advertised and unadvertised -		_____	_____	4. Gathered information about advertised and unadvertised job openings -		_____	_____
Achievement Indicators:	The learner:	Yes	No																			
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Criteria: Competence in the task will be recognized when the achievement indicators are performed according to the satisfaction of the supervisor.																						
Tools and Equipments:	Resources:																					

Duty: Using Employability Skills		Duty No. C																								
		Task No. 4																								
Task: Investigate non-wage job characteristics, using available resources, to identify significant job factors.																										
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td colspan="4">1. Listed and described:</td> </tr> <tr> <td>a. union affiliation -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>b. apprenticeship opportunities -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>c. occupational hazards -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>d. shift requirements -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>			Achievement Indicators:	The learner:	Yes	No	1. Listed and described:				a. union affiliation -		_____	_____	b. apprenticeship opportunities -		_____	_____	c. occupational hazards -		_____	_____	d. shift requirements -		_____	_____
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c. occupational hazards -		_____	_____																							
d. shift requirements -		_____	_____																							
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to the satisfaction of the supervisor.																										
Tools and Equipment:		Resources:																								

Duty: Using Employability Skills		Duty No. C																																	
		Task No. 5																																	
Task: Compile a list of personal attributes, using knowledge and information, to determine career alternatives.																																			
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Listed skills and support classes -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Listed out-of-class activities -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Described skills and competency attainment -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Developed a statement about work ability and dependability -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Developed a statement about ability to get along with others -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Developed a statement about co-op or other work experience -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Compared personal data with information about a job, further training, or other career options -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Listed skills and support classes -		_____	_____	2. Listed out-of-class activities -		_____	_____	3. Described skills and competency attainment -		_____	_____	4. Developed a statement about work ability and dependability -		_____	_____	5. Developed a statement about ability to get along with others -		_____	_____	6. Developed a statement about co-op or other work experience -		_____	_____	7. Compared personal data with information about a job, further training, or other career options -		_____	_____
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6. Developed a statement about co-op or other work experience -		_____	_____																																
7. Compared personal data with information about a job, further training, or other career options -		_____	_____																																
Criteria: Competence in the task will be recognized when the achievement indicators are performed according to the satisfaction of the supervisor.																																			
Tools and Equipment:	Resources: "Shifting the Odds," Employability Skills Guide #3, MSU.																																		

Duty: Using Employability Skills		Duty No. C																													
		Task No. 6																													
Task: Prepare a resume, using personal information, -to apply for a job.																															
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Listed name, address, and telephone number -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Identified job goal -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Identified greatest strength -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Described job-related experiences -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Provided education information -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Listed references -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Listed name, address, and telephone number -		_____	_____	2. Identified job goal -		_____	_____	3. Identified greatest strength -		_____	_____	4. Described job-related experiences -		_____	_____	5. Provided education information -		_____	_____	6. Listed references -		_____	_____
Achievement Indicators:	The learner:	Yes	No																												
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5. Provided education information -		_____	_____																												
6. Listed references -		_____	_____																												
Criteria: Competence in the task will be recognized when the achievement indicators are performed according to the satisfaction of the supervisor.																															
Tools and Equipment:	Resources: "Developing the Resume," Employability Skills Guide #4, MSU.																														

Duty: Using Employability Skills

Duty No. C

Task No. 7

Task: Write a letter of application, using personal notes, to apply for a job.

Achievement Indicators:

The learner:

Yes

No

1. Started the letter with a one-sentence paragraph -
2. Described greatest job strengths in paragraph two -
3. Identified job goal in paragraph three -
4. Asked for a personal interview in paragraph four -
5. Included closing paragraph -

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Criteria:

Competence in the task will be recognized when the achievement indicators are performed according to the satisfaction of the supervisor.

Tools and Equipment:

Resources:

"Getting in Touch with Employers," Employability Skills Guide #5, MSU.

Duty: Using Employability Skills		Duty No. C																					
		Task No. 8																					
Task: Contact an employer, using a telephone, to follow-up on a job application.																							
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Greeted receptionist -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Identified self and reason for phone call -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Asked to speak to appropriate person -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Arranged, if necessary, a time to call back -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Greeted receptionist -		_____	_____	2. Identified self and reason for phone call -		_____	_____	3. Asked to speak to appropriate person -		_____	_____	4. Arranged, if necessary, a time to call back -		_____	_____
Achievement Indicators:	The learner:	Yes	No																				
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Criteria: Competence in the task will be recognized when the achievement indicators are performed according to the satisfaction of the supervisor.																							
Tools and Equipment:		Resources:																					
		"Getting in Touch with Employers," Employability Skills Guide #5, MSU.																					

Duty: Using Employability Skills		Duty No. C													
		Task No. 9													
Task: Complete a social security form, using information, to apply for a social security number.															
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed instructions -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Filled in each space correctly -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed instructions -		_____	_____	2. Filled in each space correctly -		_____	_____
Achievement Indicators:	The learner:	Yes	No												
1. Followed instructions -		_____	_____												
2. Filled in each space correctly -		_____	_____												
Criteria: Competence in the task will be recognized when the achievement indicators are performed according to the satisfaction of the supervisor.															
Tools and Equipment:	Resources: "Handling the Paperwork," Employability Skills Guide #6, MSU.														

Duty: Using Employability Skills		Duty No. C								
		Task No. 10								
Task: Complete a job application, using personal notes, to apply for employment.										
Achievement Indicators:	The learner:	<table border="1"> <thead> <tr> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </tbody> </table>	Yes	No	_____	_____	_____	_____	_____	_____
Yes	No									
_____	_____									
_____	_____									
_____	_____									
Criteria: Competence in the task will be recognized when the achievement indicators are performed according to the satisfaction of the supervisor.										
Tools and Equipment:	Resources: "Handling the Paperwork," Employability Skills Guide #6, MSU.									

Duty: Using Employability Skills		Duty No. C	
		Task No. 11	
Task: Interview for a job, using communication skills, to secure employment.			
Achievement Indicators: 1. Demonstrated appropriate characteristics for job applicants including: a. attire - b. grooming - c. conduct during the interview - 2. Demonstrated interviewing techniques correctly -	The learner:	Yes	No
Criteria: Competence in the task will be recognized when the achievement indicators are performed according to the satisfaction of the supervisor.			
Tools and Equipment:	Resources: "Job Interviews," Employability Skills Guide #7 and 8, MSU.		

Duty: Using Employability Skills		Duty No. C													
		Task No. 12													
Task: Develop a personal job values chart, using references, to identify acceptable job offers.															
<table border="0"> <tr> <td>Achievement Indicators:</td> <td>The learner:</td> <td>Yes</td> <td>No</td> </tr> <tr> <td>1. Listed personal job values -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Rated each job value -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </table>				Achievement Indicators:	The learner:	Yes	No	1. Listed personal job values -		_____	_____	2. Rated each job value -		_____	_____
Achievement Indicators:	The learner:	Yes	No												
1. Listed personal job values -		_____	_____												
2. Rated each job value -		_____	_____												
Criteria: Competence in the task will be recognized when the achievement indicators are performed according to the satisfaction of the supervisor.															
Tools and Equipment:		Resources: "Getting the Job," Employability Skills Guide #9, MSU.													

Duty: Using Employability Skills		Duty No. C																					
		Task No. 13																					
Task: Demonstrate appropriate dress, using a knowledge of job requirements, to comply with standards of on-the-job attire and grooming.																							
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Described and/or dressed in the attire of the appropriate occupational area, including:</td> <td></td> <td></td> <td></td> </tr> <tr> <td> a. grooming -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td> b. health and safety equipment -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td> c. uniforms -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Described and/or dressed in the attire of the appropriate occupational area, including:				a. grooming -		_____	_____	b. health and safety equipment -		_____	_____	c. uniforms -		_____	_____
Achievement Indicators:	The learner:	Yes	No																				
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Tools and Equipment:	Resources:																						

Duty: Using Employability Skills		Duty No. C																																	
		Task No. 14																																	
Task: Contact the employment interviewer, using a telephone, to accept/reject a job.																																			
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Spoke with interviewer who offered the job -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Identified self -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Accepted offer, if applicable -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Found out starting date and time, if appropriate -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Rejected offer courteously and politely, if applicable -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Gave reason for rejection, if applicable -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Concluded conversation correctly -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Spoke with interviewer who offered the job -		_____	_____	2. Identified self -		_____	_____	3. Accepted offer, if applicable -		_____	_____	4. Found out starting date and time, if appropriate -		_____	_____	5. Rejected offer courteously and politely, if applicable -		_____	_____	6. Gave reason for rejection, if applicable -		_____	_____	7. Concluded conversation correctly -		_____	_____
Achievement Indicators:	The learner:	Yes	No																																
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7. Concluded conversation correctly -		_____	_____																																
Criteria: Competence in the task will be recognized when the achievement indicators are performed according to the satisfaction of the supervisor.																																			
Tools and Equipment:	Resources: "Getting the Job," Employability Skills Guide #9, MSU.																																		

Duty: Using Employability Skills		Duty No. C																	
		Task No. 15																	
Task: Complete forms, using information, to withhold city, state, and federal taxes.																			
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Completed city tax form correctly -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Completed state tax form correctly -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Completed federal tax form correctly -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Completed city tax form correctly -		_____	_____	2. Completed state tax form correctly -		_____	_____	3. Completed federal tax form correctly -		_____	_____
Achievement Indicators:	The learner:	Yes	No																
1. Completed city tax form correctly -		_____	_____																
2. Completed state tax form correctly -		_____	_____																
3. Completed federal tax form correctly -		_____	_____																
Criteria: Competence in the task will be recognized when the achievement indicators are performed according to the satisfaction of the supervisor.																			
Tools and Equipment:	Resources:																		

Duty: Using Employability Skills		Duty No. C	
		Task No. 16	
Task: Demonstrate interpersonal skills, using a knowledge of communication, to achieve successful relationships with others.			
Achievement Indicators:	The learner:	Yes	No
1. Faced person squarely -		_____	_____
2. Leaned slightly forward, if seated -		_____	_____
3. Maintained eye contact -		_____	_____
4. Reflected content of conversation -		_____	_____
5. Identified cause for conflict, if applicable -		_____	_____
6. Identified possible action to relieve conflict, if applicable -		_____	_____
Criteria: Competence in the task will be recognized when the achievement indicators are performed according to the satisfaction of the supervisor.			
Tools and Equipment:	Resources: "Keeping the Job," Employability Skills Guide #10, MSU.		

Duty: Using Employability Skills		Duty No. C															
		Task No. 17															
Task: Perform a continuing education program search, using available resources, to identify opportunities for retraining, skills upgrading, and career advancement.																	
<table border="1"> <thead> <tr> <th rowspan="2">Achievement Indicators:</th> <th rowspan="2">The learner:</th> <th>Yes</th> <th>No</th> </tr> <tr> <th></th> <th></th> </tr> </thead> <tbody> <tr> <td>1. Described types and sources of continuing education programs for an occupation -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Related information to career ladder alternatives -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No			1. Described types and sources of continuing education programs for an occupation -		_____	_____	2. Related information to career ladder alternatives -		_____	_____
Achievement Indicators:	The learner:	Yes	No														
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Criteria: Competence in the task will be recognized when the achievement indicators are performed according to the satisfaction of the supervisor.																	
Tools and Equipment:	Resources:																

Duty: Using Employability Skills		Duty No. C																													
		Task No. 18																													
Task: Describe job resignation/dismissal practice, using knowledge, to identify positive methods for terminating an employment situation.																															
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Described practices for resigning from a job:</td> <td></td> <td></td> <td></td> </tr> <tr> <td> a. gave two weeks to a months notice -</td> <td></td> <td></td> <td></td> </tr> <tr> <td> b. specified a positive reason for leaving the employment situation -</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2. Described practices for job dismissal (laid off, released):</td> <td></td> <td></td> <td></td> </tr> <tr> <td> a. asked the employer for a letter of reference if laid off -</td> <td></td> <td></td> <td></td> </tr> <tr> <td> b. talked with the employer to discover what the problem was, if released -</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Described practices for resigning from a job:				a. gave two weeks to a months notice -				b. specified a positive reason for leaving the employment situation -				2. Described practices for job dismissal (laid off, released):				a. asked the employer for a letter of reference if laid off -				b. talked with the employer to discover what the problem was, if released -			
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Criteria: Competence in the task will be recognized when the achievement indicators are performed according to the satisfaction of the supervisor.																															
Tools and Equipment:	Resources: "Knowing the Score," Employability Skills, Guide #10, MSU.																														

Duty: Using Shop Tools and Equipment		Duty No. D																													
		Task No. 1																													
Task: Demonstrate use of torque wrench, using appropriate methods, to tighten a bolt or nut.																															
<table border="0"> <tr> <td>Achievement Indicators:</td> <td>The learner:</td> <td>Yes.</td> <td>No</td> </tr> <tr> <td>1. Listed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Listed tool safety rules for use -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Listed parts of torque wrench -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Listed care and storage techniques -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Demonstrated use by tightening bolts to manufacturer's specifications -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Listed uses for torque wrench -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </table>				Achievement Indicators:	The learner:	Yes.	No	1. Listed personal safety rules -		_____	_____	2. Listed tool safety rules for use -		_____	_____	3. Listed parts of torque wrench -		_____	_____	4. Listed care and storage techniques -		_____	_____	5. Demonstrated use by tightening bolts to manufacturer's specifications -		_____	_____	6. Listed uses for torque wrench -		_____	_____
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																															
Tools and Equipment:	Resources:																														

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Duty: Using Shop Tools and Equipment		Duty No. D																													
		Task No. 2																													
Task: Measure thread sizes and styles, using appropriate materials, to identify and select appropriate thread equipment.																															
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Reviewed S.A.E. National course threads -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Reviewed S.A.E. National fine threads -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Reviewed metric thread gauging -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Measured several bolts to determine diameter -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Measured threads per inch with a thread pitch gauge -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Practiced identifying threads on assorted nuts and bolts -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Reviewed S.A.E. National course threads -		_____	_____	2. Reviewed S.A.E. National fine threads -		_____	_____	3. Reviewed metric thread gauging -		_____	_____	4. Measured several bolts to determine diameter -		_____	_____	5. Measured threads per inch with a thread pitch gauge -		_____	_____	6. Practiced identifying threads on assorted nuts and bolts -		_____	_____
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																															
Tools and Equipment:		Resources:																													
		103																													

Duty: Using Shop Tools and Equipment

Duty No. 0

Task No. 3

Task: Cut threads with tap, using appropriate equipment, to restore or create new threads.

Achievement Indicators:	The learner:	Yes	No
1. Listed personal safety rules -		_____	_____
2. Listed equipment safety rules -		_____	_____
3. Selected size tap required -		_____	_____
4. Center punched workpiece to locate drill -		_____	_____
5. Drilled appropriate size hole as per tap drill chart -		_____	_____
6. Started tap in workpiece and used cutting oil if required -		_____	_____
7. Tapped hole reversing every half turn to break chips -		_____	_____
8. Removed tap after reaching depth desired -		_____	_____
9. Cleaned threads thoroughly -		_____	_____
10. Cleaned tap of metal chips and oil -		_____	_____
11. Returned tap to storage case -		_____	_____
12. Tested thread -		_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Using Shop Tools and Equipment		Duty No. D																																																					
		Task No. 4																																																					
Task: Cut threads with die, using appropriate equipment, to restore or create new threads.																																																							
<table border="0"> <tr> <td>Achievement Indicators:</td> <td>The learner:</td> <td>Yes</td> <td>No</td> </tr> <tr> <td>1. Listed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Listed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Selected size die required -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Chamfer rod to be cut -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Located die in die holder - start side facing workpiece -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Applied cutting oil as required -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Threaded rod - stopping to reverse direction to break chip -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>8. Removed die from rod -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>9. Cleaned all threads thoroughly -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>10. Cleaned die of metal chips and oil -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>11. Returned die to storage case -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>12. Tested thread -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </table>				Achievement Indicators:	The learner:	Yes	No	1. Listed personal safety rules -		_____	_____	2. Listed equipment safety rules -		_____	_____	3. Selected size die required -		_____	_____	4. Chamfer rod to be cut -		_____	_____	5. Located die in die holder - start side facing workpiece -		_____	_____	6. Applied cutting oil as required -		_____	_____	7. Threaded rod - stopping to reverse direction to break chip -		_____	_____	8. Removed die from rod -		_____	_____	9. Cleaned all threads thoroughly -		_____	_____	10. Cleaned die of metal chips and oil -		_____	_____	11. Returned die to storage case -		_____	_____	12. Tested thread -		_____	_____
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Tools and Equipment:	Resources:																																																						

Duty: Using Shop Tools and Equipment		Duty No. D																									
		Task No. 5																									
Task: Draw file a flat surface, using supplies, to restore a warped or damaged surface.																											
<table border="0"> <tr> <td>Achievement Indicators:</td> <td>The learner:</td> <td>Yes</td> <td>No</td> </tr> <tr> <td>1. Secured stock to be filed -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Selected proper size machinist's file -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Draw filed crosswise over the work with light pressure -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Cut in both directions -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Checked surface for true -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </table>				Achievement Indicators:	The learner:	Yes	No	1. Secured stock to be filed -		_____	_____	2. Selected proper size machinist's file -		_____	_____	3. Draw filed crosswise over the work with light pressure -		_____	_____	4. Cut in both directions -		_____	_____	5. Checked surface for true -		_____	_____
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to instructions.																											
Tools and Equipment:	Resources:																										

Duty: Using Shop Tools and Equipment		Duty No. D Task No. 6																					
Task: Cut a piece of metal with a hacksaw, using appropriate techniques, to separate metal as indicated.																							
<table border="0"> <tr> <td>Achievement Indicators:</td> <td>The learner:</td> <td>Yes</td> <td>No</td> </tr> <tr> <td>1. Selected correct size blade -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Mounted blade into the frame -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Secured work piece -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Sawed workpiece to specifications -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </table>				Achievement Indicators:	The learner:	Yes	No	1. Selected correct size blade -		_____	_____	2. Mounted blade into the frame -		_____	_____	3. Secured work piece -		_____	_____	4. Sawed workpiece to specifications -		_____	_____
Achievement Indicators:	The learner:	Yes	No																				
1. Selected correct size blade -		_____	_____																				
2. Mounted blade into the frame -		_____	_____																				
3. Secured work piece -		_____	_____																				
4. Sawed workpiece to specifications -		_____	_____																				
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to instructions.																							
Tools and Equipment:	Resources:																						

Duty: Using Shop Tools and Equipment		Duty No. D	
		Task No. 7	
Task: Operate a cold chisel, using appropriate equipment, to cut a piece of flat metal.			
Achievement Indicators:		The learner:	
		Yes	No
1. Marked the metal to be cut -		_____	_____
2. Secured material in a vice -		_____	_____
3. Selected proper size chisel and hammer -		_____	_____
4. Held chisel at 30° angle from the line of cut -		_____	_____
5. Cut the metal -		_____	_____
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to instructions.			
Tools and Equipment:		Resources:	
		108	

Duty: Using Shop Tools and Equipment		Duty No. D																																																													
		Task No. 8																																																													
Task: Operate ignition analyzer (merc-o-tronic), using appropriate equipment, to test components of ignition systems.																																																															
<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; width: 40%;">Achievement Indicators:</th> <th style="text-align: left; width: 30%;">The learner:</th> <th style="text-align: center; width: 15%;">Yes</th> <th style="text-align: center; width: 15%;">No</th> </tr> </thead> <tbody> <tr> <td>1. Listed personal safety rules for operation -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>2. Listed equipment safety rules -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>3. Selected workpieces to be tested -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>4. Followed operating instructions to perform the following:</td> <td></td> <td></td> <td></td> </tr> <tr> <td> a. coil power test -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td> b. high speed test -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td> c. coil continuity -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td> d. coil resistance/primary - secondary -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td> e. breaker point test (resistance) -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td> f. condenser capacity test -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td> g. condenser leakage/short test -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td> h. coil ground test -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>5. Compared reading to manufacturer's specifications -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>6. Replaced or repaired where necessary -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Listed personal safety rules for operation -		_____	_____	2. Listed equipment safety rules -		_____	_____	3. Selected workpieces to be tested -		_____	_____	4. Followed operating instructions to perform the following:				a. coil power test -		_____	_____	b. high speed test -		_____	_____	c. coil continuity -		_____	_____	d. coil resistance/primary - secondary -		_____	_____	e. breaker point test (resistance) -		_____	_____	f. condenser capacity test -		_____	_____	g. condenser leakage/short test -		_____	_____	h. coil ground test -		_____	_____	5. Compared reading to manufacturer's specifications -		_____	_____	6. Replaced or repaired where necessary -		_____	_____
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Tools and Equipment:		Resources:																																																													

Duty: Using Shop Tools and Equipment		Duty No. D																													
		Task No. 9																													
Task: Operate a portable tachometer, using appropriate equipment, to check engine R.P.M.																															
<table border="0"> <tr> <td>Achievement Indicators:</td> <td>The learner:</td> <td>Yes</td> <td>No</td> </tr> <tr> <td>1. Listed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Listed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Reviewed operator's manual -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Determined connections to be made -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Connected to engine as required -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Tested engine R.P.M. at several throttle settings -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </table>				Achievement Indicators:	The learner:	Yes	No	1. Listed personal safety rules -		_____	_____	2. Listed equipment safety rules -		_____	_____	3. Reviewed operator's manual -		_____	_____	4. Determined connections to be made -		_____	_____	5. Connected to engine as required -		_____	_____	6. Tested engine R.P.M. at several throttle settings -		_____	_____
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																															
Tools and Equipment:	Resources:																														

Duty: Using Shop Tools and Equipment**Duty No.** D**Task No.** 10**Task:** Operate hand drill, using appropriate equipment, to drill a hole in metal to a specific size and location.

Achievement Indicators:	The learner:	Yes	No
1. Listed personal safety rules -		_____	_____
2. Listed equipment safety rules -		_____	_____
3. Selected drill bit -		_____	_____
4. Selected work piece to be drilled -		_____	_____
5. Center punched workpiece -		_____	_____
6. Secured workpiece in vice -		_____	_____
7. Secured drill bit in chuck -		_____	_____
8. Drilled hole -		_____	_____
9. Checked hole size -		_____	_____
10. Cleaned area of metal chips -		_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.**Tools and Equipment:****Resources:**

Duty: Using Shop Tools and Equipment		Duty No. D																																																	
		Task No. 11																																																	
Task: Operate drill press, using appropriate equipment, to drill a hole in metal to a specific size and location.																																																			
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Listed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Listed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Selected drill bit -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Selected work piece to be drilled -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Selected appropriate spindle speed -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Center punched work piece to be drilled -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Secured work piece in vice -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>8. Secured drill bit in chuck -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>9. Drilled hole -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>10. Checked hole size -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>11. Cleaned area of metal chips -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Listed personal safety rules -		_____	_____	2. Listed equipment safety rules -		_____	_____	3. Selected drill bit -		_____	_____	4. Selected work piece to be drilled -		_____	_____	5. Selected appropriate spindle speed -		_____	_____	6. Center punched work piece to be drilled -		_____	_____	7. Secured work piece in vice -		_____	_____	8. Secured drill bit in chuck -		_____	_____	9. Drilled hole -		_____	_____	10. Checked hole size -		_____	_____	11. Cleaned area of metal chips -		_____	_____
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Tools and Equipment:	Resources:																																																		

Duty: Using Shop Tools and Equipment		Duty No. D																									
		Task No. 12																									
Task: Operate arbor press, using appropriate equipment, to separate two items pressed together.																											
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Listed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Listed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Secured workpiece under arbor -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Selected pilot driver -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Pressed workpiece apart -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Listed personal safety rules -		_____	_____	2. Listed equipment safety rules -		_____	_____	3. Secured workpiece under arbor -		_____	_____	4. Selected pilot driver -		_____	_____	5. Pressed workpiece apart -		_____	_____
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Duty: Using Shop Tools and Equipment		Duty No. D																																							
		Task No. 13																																							
Task: Operate bench grinder, using appropriate equipment, to grind a piece of metal.																																									
<table border="0"> <thead> <tr> <th rowspan="2">Achievement Indicators:</th> <th rowspan="2">The learner:</th> <th>Yes</th> <th>No</th> </tr> <tr> <th></th> <th></th> </tr> </thead> <tbody> <tr> <td>1. Listed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Listed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Adjusted spark guards -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Adjusted table guards -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Adjusted eye guards -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Selected workpiece -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Selected wheel grit to be used -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>8. Ground metal to size -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No			1. Listed personal safety rules -		_____	_____	2. Listed equipment safety rules -		_____	_____	3. Adjusted spark guards -		_____	_____	4. Adjusted table guards -		_____	_____	5. Adjusted eye guards -		_____	_____	6. Selected workpiece -		_____	_____	7. Selected wheel grit to be used -		_____	_____	8. Ground metal to size -		_____	_____
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Duty: Using Shop Tools and Equipment		Duty No. D																																					
		Task No. 14																																					
Task: Operate valve grinder, using appropriate equipment, to grind face of valve.																																							
<table border="0"> <tr> <td>Achievement Indicators:</td> <td>The learner:</td> <td>Yes</td> <td>No</td> </tr> <tr> <td>1. Listed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Listed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Reviewed operator's manual -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Set chuck angle to manufacturer's specification -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Dressed grinding wheel -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Cleaned stem of valve -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Located in chuck and checked for "run out" -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>8. Ground face of valve -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </table>				Achievement Indicators:	The learner:	Yes	No	1. Listed personal safety rules -		_____	_____	2. Listed equipment safety rules -		_____	_____	3. Reviewed operator's manual -		_____	_____	4. Set chuck angle to manufacturer's specification -		_____	_____	5. Dressed grinding wheel -		_____	_____	6. Cleaned stem of valve -		_____	_____	7. Located in chuck and checked for "run out" -		_____	_____	8. Ground face of valve -		_____	_____
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Duty: Using Shop Tools and Equipment		Duty No. D																																					
		Task No. 15																																					
Task: Operate valve grinder, using appropriate equipment, to grind length of valve.																																							
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Listed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Listed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Reviewed operator's manual -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Checked length of valve and recorded -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Checked valve clearance to determine length needed and recorded -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Determined final valve length needed after grinding -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Centered in chuck -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>8. Ground to size needed -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Listed personal safety rules -		_____	_____	2. Listed equipment safety rules -		_____	_____	3. Reviewed operator's manual -		_____	_____	4. Checked length of valve and recorded -		_____	_____	5. Checked valve clearance to determine length needed and recorded -		_____	_____	6. Determined final valve length needed after grinding -		_____	_____	7. Centered in chuck -		_____	_____	8. Ground to size needed -		_____	_____
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Tools and Equipment:	Resources:																																						

Duty: Using Shop Tools and Equipment		Duty No. D																																	
		Task No. 16																																	
Task: Operate valve seat refacer, using appropriate equipment, to restore valve seat condition.																																			
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Listed personal safety rules -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>2. Listed equipment safety rules -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>3. Selected appropriate size pilot -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>4. Selected appropriate size stone or cutter -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>5. Dressed stone to correct angle as required by manufacturer's specifications -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>6. Ground stone -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>7. Measured seat width for reject size -</td> <td></td> <td>☐</td> <td>☐</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Listed personal safety rules -		☐	☐	2. Listed equipment safety rules -		☐	☐	3. Selected appropriate size pilot -		☐	☐	4. Selected appropriate size stone or cutter -		☐	☐	5. Dressed stone to correct angle as required by manufacturer's specifications -		☐	☐	6. Ground stone -		☐	☐	7. Measured seat width for reject size -		☐	☐
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Tools and Equipment:		Resources:																																	

Duty: Using Shop Tools and Equipment		Duty No. D																																	
		Task No. 17																																	
Task: Operate glass beading cleaner, using appropriate equipment, to clean metal of rust and corrosion.																																			
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Listed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Listed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Reviewed operator's manual -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Checked level of abrasives in machine -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Attached power/air supply -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Selected workpiece -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Cleaned (blasted) workpiece -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Listed personal safety rules -		_____	_____	2. Listed equipment safety rules -		_____	_____	3. Reviewed operator's manual -		_____	_____	4. Checked level of abrasives in machine -		_____	_____	5. Attached power/air supply -		_____	_____	6. Selected workpiece -		_____	_____	7. Cleaned (blasted) workpiece -		_____	_____
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Tools and Equipment:	Resources:																																		

Duty: Using Shop Tools and Equipment		Duty No. D																																	
		Task No. 18																																	
Task: Operate power washer, using appropriate materials, to clean equipment of dirt and grease.																																			
<table border="0"> <tr> <td>Achievement Indicators:</td> <td>The learner:</td> <td>Yes</td> <td>No</td> </tr> <tr> <td>1. Listed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Listed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Reviewed operator's manual -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Connected power washer to water and power supply -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Protected items not to be exposed to water -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Prepared equipment with pre-solvents to loosen dirt -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Cleaned equipment as required -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </table>				Achievement Indicators:	The learner:	Yes	No	1. Listed personal safety rules -		_____	_____	2. Listed equipment safety rules -		_____	_____	3. Reviewed operator's manual -		_____	_____	4. Connected power washer to water and power supply -		_____	_____	5. Protected items not to be exposed to water -		_____	_____	6. Prepared equipment with pre-solvents to loosen dirt -		_____	_____	7. Cleaned equipment as required -		_____	_____
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Tools and Equipment:		Resources:																																	

Duty: Using Shop Tools and Equipment

Duty No. D

Task No. 19

Task: Operate cylinder boring machine, using appropriate equipment, to bore cylinder to specified dimensions.

Achievement Indicators:	The learner:	Yes	No
1. Listed personal safety rules -		_____	_____
2. Listed equipment safety rules -		_____	_____
3. Demonstrated use of measuring devices -		_____	_____
4. Selected workpiece and determined size -		_____	_____
5. Centered cylinder within .001 to boring bar -		_____	_____
6. Selected speed and feed requirements as per need -		_____	_____
7. Selected appropriate cutting tool -		_____	_____
8. Bored cylinder to specified dimension -		_____	_____
9. Cleaned work area and workpiece -		_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Using Shop Tools and Equipment		Duty No. D																																					
		Task No. 20																																					
Task: Operate dynamometer, using appropriate equipment, to test engine power under various conditions.																																							
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Listed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Listed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Reviewed operator's manual -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Selected appropriate dynamometer for engine being tested -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Attached to engine as required -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Reviewed formula for horsepower -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Tested engine as per operator's manual -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>8. Plotted power curve -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Listed personal safety rules -		_____	_____	2. Listed equipment safety rules -		_____	_____	3. Reviewed operator's manual -		_____	_____	4. Selected appropriate dynamometer for engine being tested -		_____	_____	5. Attached to engine as required -		_____	_____	6. Reviewed formula for horsepower -		_____	_____	7. Tested engine as per operator's manual -		_____	_____	8. Plotted power curve -		_____	_____
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Tools and Equipment:	Resources:																																						

Duty: Using Shop Tools and Equipment

Duty No. D

Task No. 21

Task: Operate spark plug cleaner/tester, using appropriate equipment, to clean and test spark plug.

Achievement Indicators:

The learner:

Yes

No

1. Listed personal safety rules -
2. Listed equipment safety rules -
3. Reviewed operator's manual -
4. Attached air supply and power supply -
5. Cleaned spark plug -
6. Tested for pressure failure -
7. Disconnected machine -

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Using Shop Tools and Equipment		Duty No. D																																					
		Task No. 22																																					
Task: Remove broken stud, using appropriate equipment, to replace stud and restore proper thread condition.																																							
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Center punched the stud -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Drilled small pilot hole into the stud -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Selected proper drill size for extractor used -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Drilled larger hole in the stud -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Inserted extractor and turned counterclockwise -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Removed broken stud -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Inspected thread condition -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>8. Repaired if necessary -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Center punched the stud -		_____	_____	2. Drilled small pilot hole into the stud -		_____	_____	3. Selected proper drill size for extractor used -		_____	_____	4. Drilled larger hole in the stud -		_____	_____	5. Inserted extractor and turned counterclockwise -		_____	_____	6. Removed broken stud -		_____	_____	7. Inspected thread condition -		_____	_____	8. Repaired if necessary -		_____	_____
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Tools and Equipment:		Resources:																																					

Duty: Using Shop Tools and Equipment		Duty No. D																																									
		Task No. 23																																									
Task: Set-up oxy-acetylene torch and assemble all components, using equipment, to ready torch for operation.																																											
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Checked safety caps on cylinders before moving -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Checked cart for safety chains, and any defects that could cause it to tip -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Installed cylinder in cart, with proper safety chain attachment -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Removed safety cover from oxygen cylinder and installed pressure regulator, making sure the pressure adjustment screw was turned completely out -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Removed safety cover from acetylene cylinder and installed pressure regulator, making sure the pressure adjustment screw was turned completely out -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Inspected hoses for cuts, kinks, burns, or defects that could cause leaking -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Installed hoses on regulators; red to acetylene, and green to oxygen -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>8. Attached hoses to welding torch handle -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>9. Checked striker for operation, replaced flint if needed -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Checked safety caps on cylinders before moving -		_____	_____	2. Checked cart for safety chains, and any defects that could cause it to tip -		_____	_____	3. Installed cylinder in cart, with proper safety chain attachment -		_____	_____	4. Removed safety cover from oxygen cylinder and installed pressure regulator, making sure the pressure adjustment screw was turned completely out -		_____	_____	5. Removed safety cover from acetylene cylinder and installed pressure regulator, making sure the pressure adjustment screw was turned completely out -		_____	_____	6. Inspected hoses for cuts, kinks, burns, or defects that could cause leaking -		_____	_____	7. Installed hoses on regulators; red to acetylene, and green to oxygen -		_____	_____	8. Attached hoses to welding torch handle -		_____	_____	9. Checked striker for operation, replaced flint if needed -		_____	_____
Achievement Indicators:	The learner:	Yes	No																																								
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Tools and Equipment:		Resources:																																									
		124																																									

Duty: Using Shop Tools and Equipment

Duty No. D

Task No. 24

Task: Light oxy-acetylene torch, using appropriate equipment, to maintain a proper flame.

Achievement Indicators:	The learner:	Yes	No
1. Inspected visually welding equipment for proper set-up and corrected any safety defects -		_____	_____
2. Checked pressure regulator adjustment screws to assure they were completely released -		_____	_____
3. Installed torch tip of proper size -		_____	_____
4. Opened slowly both oxygen and acetylene cylinders -		_____	_____
5. Adjusted pressure regulators to desired pressure -		_____	_____
6. Kept the tip pointed downward and away from the operator, slightly opened the acetylene valve and lit the gas with a striker -		_____	_____
7. Opened slowly the oxygen valve until the flame changed from yellow to blue -		_____	_____
8. Viewed flame through smoked welding goggles until the three flame components could be identified -		_____	_____
9. Continued turning the oxygen valve until the secondary flame disappeared completely -		_____	_____
10. Demonstrated a neutral flame just at the point when the secondary flame disappeared -		_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to instructions.

Tools and Equipment:

Resources:

Duty: Using Shop Tools and Equipment		Duty No. D																								
		Task No. 25																								
Task: Join metal by braze welding, using appropriate equipment, to braze weld two pieces of metal.																										
Achievement Indicators:	The learner:	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;"></th> <th style="width: 25%; text-align: center;">Yes</th> <th style="width: 25%; text-align: center;">No</th> </tr> </thead> <tbody> <tr> <td>1. Placed workpiece so edges overlapped on welding bench -</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>2. Selected tip, opened tanks, adjusted regulators -</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>3. Lighted torch and adjusted to neutral flame -</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>4. Heated workpieces until the metal just began to glow -</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>5. Melted a small amount of bronze rod and let it spread over joint to tin the surface -</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>6. Carried the braze up the joint adding filler rod using a slightly circular motion of the torch -</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>7. Practiced until braze welds were of equal width and height -</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> </tbody> </table>		Yes	No	1. Placed workpiece so edges overlapped on welding bench -	_____	_____	2. Selected tip, opened tanks, adjusted regulators -	_____	_____	3. Lighted torch and adjusted to neutral flame -	_____	_____	4. Heated workpieces until the metal just began to glow -	_____	_____	5. Melted a small amount of bronze rod and let it spread over joint to tin the surface -	_____	_____	6. Carried the braze up the joint adding filler rod using a slightly circular motion of the torch -	_____	_____	7. Practiced until braze welds were of equal width and height -	_____	_____
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to instructions.																										
Tools and Equipment:	Resources:																									

Duty: Using Shop Tools and Equipment**Duty No.** D**Task No.** 26**Task:** Puddle weld two metal workpieces, using appropriate equipment, to join workpieces together.**Achievement Indicators:**

The learner:

Yes

No

1. Placed workpieces so edges adjoined on the welding bench - ☐ ☐
2. Selected tip, opened tanks and adjusted regulators - ☐ ☐
3. Lit torch and adjusted to a neutral flame - ☐ ☐
4. Held torch about 1/8 inch and at a 45° angle above workpieces straddling the seam - ☐ ☐
5. Formed molten pool of metal, began to carry it along the seam, forming bead with even width and even ripples - ☐ ☐
6. Practiced until a continuous weld of at least three inches was performed - ☐ ☐

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to instructions.**Tools and Equipment:****Resources:**

Duty: Using Shop Tools and Equipment**Duty No.** D**Task No.** 27**Task:** Operate oxy-acetylene torch, using appropriate equipment, to cut a piece of metal clean and even.**Achievement Indicators:**

The learner:

Yes

No

1. Placed workpiece on welding bench, or bench vise assuring an open space underneath it to receive cutting flames and slag -
2. Installed cutting head on torch -
3. Opened tanks and adjusted regulators to proper pressure -
4. Lighted torch and adjusted to neutral flame -
5. Heated workpiece at edge until molten -
6. Depressed cutting handle and continued moving across workpiece -
7. Practiced until you could produce clean, even cuts -

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to instructions.**Tools and Equipment:****Resources:**

Duty: Using Shop Tools and Equipment		Duty No. D Task No. 28																																									
Task: Sweat soldered two metal surfaces, using appropriate equipment, to seal and join together.																																											
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Reviewed procedure for propane torch operation -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Cleaned surfaces to be soldered -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Selected appropriate solder and flux -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Pre-heated area -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Soldered surfaces -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>8. Removed excess solder and flux -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>9. Tested joints for leaks and strength -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Followed equipment safety rules -		_____	_____	3. Reviewed procedure for propane torch operation -		_____	_____	4. Cleaned surfaces to be soldered -		_____	_____	5. Selected appropriate solder and flux -		_____	_____	6. Pre-heated area -		_____	_____	7. Soldered surfaces -		_____	_____	8. Removed excess solder and flux -		_____	_____	9. Tested joints for leaks and strength -		_____	_____
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Tools and Equipment:	Resources:																																										

Duty: Using Shop Tools and Equipment		Duty No. D																																	
		Task No. 29																																	
Task: Solder two wires together, using appropriate equipment, to join wires and form an electrical connection.																																			
Achievement Indicators:	The learner:	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 80%;"></th> <th style="width: 10%; text-align: center;">Yes</th> <th style="width: 10%; text-align: center;">No</th> </tr> </thead> <tbody> <tr><td>1. Followed personal safety rules -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>2. Followed equipment safety rules -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>3. Reviewed procedure for soldering -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>4. Reviewed types of solder and fluxes -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>5. Cleaned wires to be soldered -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>6. Performed a western union splice -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>7. Performed a tap splice -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>8. Soldered wires -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>9. Tested joint for strength and continuity -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>10. Wrapped joint with insulating tape or shrink cover -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> </tbody> </table>		Yes	No	1. Followed personal safety rules -	_____	_____	2. Followed equipment safety rules -	_____	_____	3. Reviewed procedure for soldering -	_____	_____	4. Reviewed types of solder and fluxes -	_____	_____	5. Cleaned wires to be soldered -	_____	_____	6. Performed a western union splice -	_____	_____	7. Performed a tap splice -	_____	_____	8. Soldered wires -	_____	_____	9. Tested joint for strength and continuity -	_____	_____	10. Wrapped joint with insulating tape or shrink cover -	_____	_____
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																																			
Tools and Equipment:	Resources:																																		

Duty: Servicing and Repairing Four-Cycle Engines		Duty No. E																					
		Task No. 1																					
Task: Calculate engine displacement, using appropriate materials, to determine engine size.																							
<table border="0"> <tr> <td>Achievement Indicators:</td> <td>The learner:</td> <td>Yes</td> <td>No</td> </tr> <tr> <td>1. Listed formula for volume of a cylinder -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Measured engine bore -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Measured engine stroke -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Used formula to calculate cubic inch displacement -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </table>				Achievement Indicators:	The learner:	Yes	No	1. Listed formula for volume of a cylinder -		_____	_____	2. Measured engine bore -		_____	_____	3. Measured engine stroke -		_____	_____	4. Used formula to calculate cubic inch displacement -		_____	_____
Achievement Indicators:	The learner:	Yes	No																				
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																							
Tools and Equipment:	Resources:																						

Teacher Activities	Student Learning Activities
1. Provide and explain formula for volume of a cylinder. 2. Work several problems. 3. Explain and demonstrate bore measurement. 4. Explain and demonstrate stroke measurement. 5. Provide measurement on actual cylinder. 6. Use measurements in actual formula.	1. Copy formula for cylinder volume. 2. Practice on several problems. 3. Measure bore and stroke. 4. Use measurements to figure actual volume on engine. 132

Duty: Servicing and Repairing Four-Cycle Engines		Duty No. E																	
		Task No. 2																	
Task: Calculate compression ratio, using appropriate materials, to determine compression ratio of an engine.																			
<table border="0"> <tr> <td>Achievement Indicators:</td> <td>The learner:</td> <td>Yes</td> <td>No</td> </tr> <tr> <td>1. Reviewed compression ratio -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Measured engine to determine T.D.C. and B.D.C. -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Figured compression ratio -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </table>				Achievement Indicators:	The learner:	Yes	No	1. Reviewed compression ratio -		_____	_____	2. Measured engine to determine T.D.C. and B.D.C. -		_____	_____	3. Figured compression ratio -		_____	_____
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Tools and Equipment:		Resources:																	

Duty: Servicing and Repairing Four-Cycle Engines		Duty No. E																					
		Task No. 3																					
Task: Locate applications of small engines, using appropriate materials, to show their use and need.																							
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Located as many different applications available to area -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Explained the purpose of each type -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Examined applications -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Examined the methods of power transmission -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Located as many different applications available to area -		_____	_____	2. Explained the purpose of each type -		_____	_____	3. Examined applications -		_____	_____	4. Examined the methods of power transmission -		_____	_____
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Tools and Equipment:		Resources:																					
		134																					

Duty: Servicing and Repairing Four-Cycle Engines		Duty No. E																													
		Task No. 4																													
Task: Locate engine model and serial number, using required materials, to determine engine specifications.																															
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety precautions -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Located area where numbers are found -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Wiped number plate clean -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Recorded numbers -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Used master parts/specifications to locate numbers -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Recorded pertinent data regarding engine -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety precautions -		_____	_____	2. Located area where numbers are found -		_____	_____	3. Wiped number plate clean -		_____	_____	4. Recorded numbers -		_____	_____	5. Used master parts/specifications to locate numbers -		_____	_____	6. Recorded pertinent data regarding engine -		_____	_____
Achievement Indicators:	The learner:	Yes	No																												
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Tools and Equipment:		Resources: 135																													

Duty: Servicing and Repairing Four-Cycle Engines

Duty No. E

Task No. 5

Task: Perform compression check, using appropriate materials, to determine engine condition.

Achievement Indicators:

The learner:

Yes

No

1. Followed personal safety rules -
2. Followed equipment safety rules -
3. Performed "dry" compression check -
4. Performed "wet" compression check -
5. Compared to manufacturer's specifications -

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing and Repairing Four-Cycle Engines

Duty No. E

Task No. 6

Task: Interpret compression readings, using appropriate materials, to determine engine condition.

Achievement Indicators:	The learner:	Yes	No
1. Reviewed procedure for doing compression check -		_____	_____
2. Recorded compression reading "dry" -		_____	_____
3. Recorded compression reading "wet" -		_____	_____
4. Compared readings -		_____	_____
5. Determined part failure -		_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing and Repairing Four-Cycle Engines

Duty No. E

Task No. 7

Task: Perform cylinder leakage test, using appropriate equipment, to determine ring/cylinder condition.

Achievement Indicators:

The learner:

Yes

No

1. Followed personal safety rules -
2. Followed equipment safety rules -
3. Performed leakage test on cylinder -
4. Recorded findings -
5. Compared to manufacturer's specifications -

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing and Repairing Four-Cycle Engines		Duty No. E																																					
		Task No. 8																																					
Task: Remove engine from machine, using required tools, to allow for disassembly procedure.																																							
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>2. Followed machinery safety rules -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>3. Listed procedure for removal -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>4. Secured container for parts -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>5. Removed spark plug wire and grounded to block -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>6. Removed blade -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>7. Disconnected cables and controls -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>8. Removed engine mounting bolts -</td> <td></td> <td>☐</td> <td>☐</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		☐	☐	2. Followed machinery safety rules -		☐	☐	3. Listed procedure for removal -		☐	☐	4. Secured container for parts -		☐	☐	5. Removed spark plug wire and grounded to block -		☐	☐	6. Removed blade -		☐	☐	7. Disconnected cables and controls -		☐	☐	8. Removed engine mounting bolts -		☐	☐
Achievement Indicators:	The learner:	Yes	No																																				
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Tools and Equipment:	Resources:																																						

Duty: Servicing and Repairing Four-Cycle Engines		Duty No. E
		Task No. 9
Task: Prepare engine for disassembly, using appropriate tools, to insure safe conditions of disassembly.		
Achievement Indicators:	The learner:	
1. Followed personal safety rules -		Yes
2. Followed equipment safety rules -		No
3. Secured container for parts -		
4. Drained oil -		
5. Drained gasoline -		
6. Recorded engine model and serial numbers -		
7. Conducted visual check of engine components -		
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.		
Tools and Equipment:	Resources:	

Duty: Servicing and Repairing Four-Cycle Engines		Duty No. E																																									
		Task No. 10																																									
Task: Drain engine oil, using appropriate equipment, to remove dirt and other contaminants.																																											
<table border="0"> <thead> <tr> <th style="text-align: left;">Achievement Indicators:</th> <th style="text-align: left;">The learner:</th> <th style="text-align: center;">Yes</th> <th style="text-align: center;">No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>3. Located engine drain plug and removed -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>4. Drained oil in suitable container -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>5. Inspected oil for foreign materials -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>6. Cleaned oil drain plug threads -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>7. Installed oil drain plug -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>8. Tagged engine with "NO OIL" tag -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>9. Wiped up any spilled oil -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Followed equipment safety rules -		_____	_____	3. Located engine drain plug and removed -		_____	_____	4. Drained oil in suitable container -		_____	_____	5. Inspected oil for foreign materials -		_____	_____	6. Cleaned oil drain plug threads -		_____	_____	7. Installed oil drain plug -		_____	_____	8. Tagged engine with "NO OIL" tag -		_____	_____	9. Wiped up any spilled oil -		_____	_____
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Duty: Servicing and Repairing Four-Cycle Engines	Duty No. E																																																																																													
	Task No. 11																																																																																													
Task: Disassemble four-cycle engine, using appropriate equipment, to practice disassembly procedure.																																																																																														
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr><td>1. Followed personal safety rules -</td><td></td><td>_____</td><td>_____</td></tr> <tr><td>2. Followed equipment safety rules -</td><td></td><td>_____</td><td>_____</td></tr> <tr><td>3. Removed gasoline -</td><td></td><td>_____</td><td>_____</td></tr> <tr><td>4. Recorded model and serial numbers -</td><td></td><td>_____</td><td>_____</td></tr> <tr><td>5. Removed spark plug and grounded to engine -</td><td></td><td>_____</td><td>_____</td></tr> <tr><td>6. Drained oil -</td><td></td><td>_____</td><td>_____</td></tr> <tr><td>7. Removed blower housing -</td><td></td><td>_____</td><td>_____</td></tr> <tr><td>8. Removed carburetor and linkage -</td><td></td><td>_____</td><td>_____</td></tr> <tr><td>9. Removed governor air vane or governor linkage -</td><td></td><td>_____</td><td>_____</td></tr> <tr><td>10. Removed muffler -</td><td></td><td>_____</td><td>_____</td></tr> <tr><td>11. Removed crankcase breather or valve cover -</td><td></td><td>_____</td><td>_____</td></tr> <tr><td>12. Removed cylinder head -</td><td></td><td>_____</td><td>_____</td></tr> <tr><td>13. Removed air deflector -</td><td></td><td>_____</td><td>_____</td></tr> <tr><td>14. Removed starter clutch -</td><td></td><td>_____</td><td>_____</td></tr> <tr><td>15. Removed grass screen -</td><td></td><td>_____</td><td>_____</td></tr> <tr><td>16. Removed flywheel -</td><td></td><td>_____</td><td>_____</td></tr> <tr><td>17. Removed ignition system (as required) -</td><td></td><td>_____</td><td>_____</td></tr> <tr><td>18. Removed sump cover -</td><td></td><td>_____</td><td>_____</td></tr> <tr><td>19. Removed oil pump or slinger -</td><td></td><td>_____</td><td>_____</td></tr> <tr><td>20. Removed camshaft drive gear -</td><td></td><td>_____</td><td>_____</td></tr> <tr><td>21. Removed valve lifters (tappets) -</td><td></td><td>_____</td><td>_____</td></tr> <tr><td>22. Removed piston rod assembly -</td><td></td><td>_____</td><td>_____</td></tr> </tbody> </table>	Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Followed equipment safety rules -		_____	_____	3. Removed gasoline -		_____	_____	4. Recorded model and serial numbers -		_____	_____	5. Removed spark plug and grounded to engine -		_____	_____	6. Drained oil -		_____	_____	7. Removed blower housing -		_____	_____	8. Removed carburetor and linkage -		_____	_____	9. Removed governor air vane or governor linkage -		_____	_____	10. Removed muffler -		_____	_____	11. Removed crankcase breather or valve cover -		_____	_____	12. Removed cylinder head -		_____	_____	13. Removed air deflector -		_____	_____	14. Removed starter clutch -		_____	_____	15. Removed grass screen -		_____	_____	16. Removed flywheel -		_____	_____	17. Removed ignition system (as required) -		_____	_____	18. Removed sump cover -		_____	_____	19. Removed oil pump or slinger -		_____	_____	20. Removed camshaft drive gear -		_____	_____	21. Removed valve lifters (tappets) -		_____	_____	22. Removed piston rod assembly -		_____	_____		
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- | | Yes | No |
|---|-------|-------|
| 23. Removed piston rings - | _____ | _____ |
| 24. Removed wrist pin clips and pin - | _____ | _____ |
| 25. Removed connecting rod - | _____ | _____ |
| 26. Removed both valves - | _____ | _____ |
| 27. Removed all remaining parts as required - | _____ | _____ |

Criteria:

Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:**Resources:**

Duty: Servicing and Repairing Four-Cycle Engines

Duty No. E

Task No. 12

Task: Clean engine, using appropriate equipment, to remove all loose dirt and oil.

Achievement Indicators:

The learner:

Yes

No

1. Referred to manufacturer's repair manual for correct procedure - _____
2. Obtained cleaning equipment and cleaning solvent - _____
3. Referred to equipment manufacturer's specifications and procedures for steam cleaning the engine - _____
4. Protected carburetor by covering with waterproof material - _____
5. Protected gas tank from water - _____
6. Cleaned engine - _____
7. Dried as needed (where applicable) - _____
8. Protected against rust (where applicable) with the proper anti-rust agent - _____
9. Started engine and checked for any malfunctions occurring due to moisture or foreign particles in the operational parts - _____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:
Resources:

Duty: Servicing and Repairing Four-Cycle Engines

Duty No. E

Task No. 13

Task: Inspect cylinder block, using appropriate equipment, to determine wear and servicability.

Achievement Indicators:

The learner:

Yes

No

1. Recorded bore size as per manufacturer's specification using model and serial numbers -
2. Measured cylinder bore-recorded -
3. Measured cylinder bore for "out of round" -
4. Inspected for scratches -
5. Inspected all bearing surfaces -
6. Inspected governor mechanism (where applicable) -

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:
Resources:

DPI 145

Duty: Servicing and Repairing Four-Cycle Engines		Duty No. E																																									
		Task No. 14																																									
Task: Inspect piston and rings, using appropriate equipment, to determine wear and serviceability.																																											
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Performed previous compression check -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>2. Inspected piston head for carbon -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>3. Inspected skirt for scratches and wear (blow-by) -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>4. Inspected piston pin and surface -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>5. Followed safety precautions for ring removal -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>6. Removed piston rings -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>7. Measured ring groove side clearance -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>8. Measured ring end gap -recorded -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>9. Inspected surface condition of cylinder -</td> <td></td> <td>☐</td> <td>☐</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Performed previous compression check -		☐	☐	2. Inspected piston head for carbon -		☐	☐	3. Inspected skirt for scratches and wear (blow-by) -		☐	☐	4. Inspected piston pin and surface -		☐	☐	5. Followed safety precautions for ring removal -		☐	☐	6. Removed piston rings -		☐	☐	7. Measured ring groove side clearance -		☐	☐	8. Measured ring end gap -recorded -		☐	☐	9. Inspected surface condition of cylinder -		☐	☐
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Tools and Equipment:	Resources:																																										

Duty: Servicing and Repairing Four-Cycle Engines

Duty No. E

Task No. 15

Task: Inspect connecting rod, using appropriate equipment, to determine wear and serviceability.

Achievement Indicators:

The learner:

Yes

No

1. Inspected "match marks" for proper alignment -
2. Measured torque on bolts and recorded -
3. Inspected rod journal for scratches -
4. Measured rod journal for "out of round" -
5. Inspected wrist pin journal -

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:
Resources:

147

Duty: Servicing and Repairing Four-Cycle Engines		Duty No. E																
		Task No. 16																
Task: Inspect crankshaft, using appropriate equipment, to determine wear and serviceability.																		
Achievement Indicators:	The learner:	<table border="1"> <thead> <tr> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </tbody> </table>	Yes	No	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
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_____	_____																	
1. Followed safety precautions for handling -																		
2. Inspected outer journal surfaces for scratches -																		
3. Inspected bearings (if applicable) -																		
4. Inspected crankshaft journal for wear and scratches -																		
5. Measured crankshaft journal for "out of round" and reject size -																		
6. Measured crankshaft end play prior to removal -																		
7. Inspected keyways for damage -																		
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																		
Tools and Equipment:	Resources:																	

Duty: Servicing and Repairing Four-Cycle Engines**Duty No.** E**Task No.** 17**Task:** Inspect fuel system parts, using appropriate equipment, to determine wear and serviceability.**Achievement Indicators:**

The learner:

Yes

No

1. Inspected condition of fuel -
2. Inspected gas tank for leaks -
3. Inspected cap for plugged vent holes -
4. Inspected fuel lines for cracks and swelling -
5. Inspected all gaskets for leaks -
6. Inspected all parts of carburetor as applicable -
7. Inspected controls and linkages -
8. Inspected intake manifold -

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.**Tools and Equipment:****Resources:**

Duty: Servicing and Repairing Four-Cycle Engines

Duty No. E

Task No. 18

Task: Inspect valve system parts, using appropriate equipment, to determine wear and serviceability.

Achievement Indicators:

The learner:

Yes

No

1. Checked valve clearance -
2. Inspected face of valves for wear and leaks -
3. Inspected seat for wear and leaks -
4. Inspected valve stem for wear -
5. Inspected valve guide for wear -
6. Checked valve return spring height -
7. Checked valve margin thickness -
8. Checked valve head for run-out -

_____	_____
_____	_____
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_____	_____
_____	_____
_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:
Resources:

Duty: Servicing and Repairing Four-Cycle Engines		Duty No. E	
		Task No. 19	
Task: Inspect valve clearance using appropriate equipment, to maintain operating conditions.			
Achievement Indicators:	The learner:	Yes	No
1. Followed personal safety rules -		_____	_____
2. Followed equipment safety rules -		_____	_____
3. Removed crankcase breather or valve cover -		_____	_____
4. Rotated piston to top dead center -		_____	_____
5. Checked valve to lifter clearance with feeler gauges, both valves -		_____	_____
6. Checked to see that cams are at their lowest point -		_____	_____
7. Compared readings to manufacturer's specifications -		_____	_____
8. Rotated engine and re-checked again -		_____	_____
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.			
Tools and Equipment:	Resources:		

Duty: Servicing and Repairing Four-Cylinder Engines		Duty No. E
		Task No. 20
Task: Inspect valve lifters, using appropriate equipment, to determine wear and serviceability.		
Achievement Indicators:	The learner:	Yes No
	1. Inspected for difference in size and marked -	_____
	2. Inspected for wear -	_____
	3. Inspected lifter guides for "play" -	_____
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.		
Tools and Equipment:	Resources:	

Duty: Servicing and Repairing Four-Cycle Engines		Duty No. E																					
		Task No. 21																					
Task: Inspect camshaft drive gear, using appropriate equipment, to determine wear and serviceability.																							
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Checked timing mark alignment prior to removal -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>2. Inspected cam bearing surfaces -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>3. Inspected cam lobes for wear and flat spots -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>4. Inspected timing gear teeth for chips or missing tooth -</td> <td></td> <td>☐</td> <td>☐</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Checked timing mark alignment prior to removal -		☐	☐	2. Inspected cam bearing surfaces -		☐	☐	3. Inspected cam lobes for wear and flat spots -		☐	☐	4. Inspected timing gear teeth for chips or missing tooth -		☐	☐
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Tools and Equipment:	Resources:																						

Duty: Servicing and Repairing Four-Cycle Engines		Duty No. E																													
		Task No. 22																													
Task: Inspect crankcase breather assembly, using appropriate equipment, to determine operating condition.																															
<table border="0"> <tr> <td>Achievement Indicators:</td> <td>The learner:</td> <td>Yes</td> <td>No</td> </tr> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Reviewed crankcase breather operation -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Measured pressure release clearance -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Inspected breather for oil leakage -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Cleaned oil return passages -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Followed equipment safety rules -		_____	_____	3. Reviewed crankcase breather operation -		_____	_____	4. Measured pressure release clearance -		_____	_____	5. Inspected breather for oil leakage -		_____	_____	6. Cleaned oil return passages -		_____	_____
Achievement Indicators:	The learner:	Yes	No																												
1. Followed personal safety rules -		_____	_____																												
2. Followed equipment safety rules -		_____	_____																												
3. Reviewed crankcase breather operation -		_____	_____																												
4. Measured pressure release clearance -		_____	_____																												
5. Inspected breather for oil leakage -		_____	_____																												
6. Cleaned oil return passages -		_____	_____																												
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																															
Tools and Equipment:	Resources:																														

Duty: Servicing and Repairing Four-Cycle Engines

Duty No. E

Task No. 23

Task: Inspect engine for bent crankshaft, using appropriate equipment, to determine source of vibration.

Achievement Indicators:	The learner:	Yes	No
1. Followed personal safety rules -		_____	_____
2. Removed spark plug and grounded wire to chassis -		_____	_____
3. Secured engine on test stand -		_____	_____
4. Observed rotation of engine crankshaft for deviation -		_____	_____
5. Measured crankshaft travel with dial indicator -		_____	_____
6. Recorded findings -		_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:
Resources:

Duty: Servicing and Repairing Four-Cycle Engines**Duty No.** E**Task No.** 24**Task:** Reassemble four-cycle engine, using appropriate equipment, to return engine to operating condition.**Achievement Indicators:**

The learner:

Yes

No

- | | | |
|---|-------|-------|
| 1. Followed personal safety rules - | _____ | _____ |
| 2. Followed equipment safety rules - | _____ | _____ |
| 3. Reviewed reassembly procedures - | _____ | _____ |
| 4. Oiled all moving parts - | _____ | _____ |
| 5. Installed parts in reverse order of disassembly making adjustments as required - | _____ | _____ |
| 6. Tightened all bolts to appropriate torque - | _____ | _____ |
| 7. Wiped engine of oil and finger prints - | _____ | _____ |
| 8. Mounted on test stand - | _____ | _____ |
| 9. Filled with gasoline and oil - | _____ | _____ |
| 10. Performed a safety inspection - | _____ | _____ |
| 11. Started engine-adjusted as required - | _____ | _____ |

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.**Tools and Equipment:****Resources:**

Duty: Servicing and Repairing Four-Cycle Engines

Duty No. E

Task No. 25

Task: Remove cylinder head, using appropriate tools, to inspect cylinder and head.

Achievement indicators:

The learner:

Yes

No

1. Followed personal safety rules -
2. Followed materials safety rules -
3. Followed procedure for removal -
4. Recorded pressure of bolts -
5. Removed head -
6. Inspected head for carbon build-up -
7. Inspected combustion chamber -
8. Inspected gasket for signs of leakage -
9. Removed carbon build-up -
10. Cleaned all surfaces -
11. Checked head for warpage -

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing and Repairing Four-Cycle Engines

Duty No. E

Task No. 26

Task: Install cylinder head, using appropriate tools, to seal combustion chamber.

Achievement Indicators:	The learner:	Yes	No
1. Followed personal safety rules -		_____	_____
2. Followed materials safety rules -		_____	_____
3. Cleaned all gasket surfaces -		_____	_____
4. Secured proper replacement gasket -		_____	_____
5. Reviewed manufacturer's specifications for tightening sequence and torque -		_____	_____
6. Installed head gasket -		_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing and Repairing Four-Cycle Engines		Duty No. E	
		Task No. 27	
Task: Remove valves, using appropriate equipment, to allow for servicing and inspection.			
Achievement indicators:	The learner:	Yes	No
1. Followed personal safety rules -		_____	_____
2. Followed equipment safety rules -		_____	_____
3. Selected appropriate tool for valve removal -		_____	_____
4. Removed both valves -		_____	_____
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.			
Tools and Equipment:	Resources:		

Duty: Servicing and Repairing Four-Cycle Engines		Duty No. E																									
		Task No. 28																									
Task: Install valves, using appropriate equipment, to return valves to operating condition.																											
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Selected appropriate tool for installation -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Installed valves -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Checked valve clearance -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Followed equipment safety rules -		_____	_____	3. Selected appropriate tool for installation -		_____	_____	4. Installed valves -		_____	_____	5. Checked valve clearance -		_____	_____
Achievement Indicators:	The learner:	Yes	No																								
1. Followed personal safety rules -		_____	_____																								
2. Followed equipment safety rules -		_____	_____																								
3. Selected appropriate tool for installation -		_____	_____																								
4. Installed valves -		_____	_____																								
5. Checked valve clearance -		_____	_____																								
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																											
Tools and Equipment:	Resources:																										

Duty: Servicing and Repairing Four-Cylinder Engines		Duty No. E																
		Task No. 29																
Task: Replace valve guides, using appropriate equipment, to restore valve operation to manufacturer's specifications.																		
Achievement Indicators:	The learner:	<table border="1"> <thead> <tr> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </tbody> </table>	Yes	No	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Yes	No																	
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_____	_____																	
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to Manufacturer's specifications.																		
Tools and Equipment:	Resources:																	

Duty: Servicing and Repairing Four-Cylinder Engines

Duty No. E

Task No. 30

Task: Remove flywheel, using appropriate flywheel puller, to expose ignition system.

Achievement Indicators:

The learner:

Yes

No

1. Followed personal safety rules -
2. Followed equipment safety rules -
3. Listed different styles of flywheel pullers -
4. Described theory of operation -
5. Removed flywheel -

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing and Repairing Four-Cycle Engines		Duty No. E																																					
		Task No. 31																																					
Task: Remove crankshaft bearing (ball), using appropriate equipment, to service or replace bearing.																																							
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Reviewed procedure for removal -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Removed bearing -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Inspected bearing for wear -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Installed new bearing -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Prelubricated bearing -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>8. Tested operation -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Followed equipment safety rules -		_____	_____	3. Reviewed procedure for removal -		_____	_____	4. Removed bearing -		_____	_____	5. Inspected bearing for wear -		_____	_____	6. Installed new bearing -		_____	_____	7. Prelubricated bearing -		_____	_____	8. Tested operation -		_____	_____
Achievement Indicators:	The learner:	Yes	No																																				
1. Followed personal safety rules -		_____	_____																																				
2. Followed equipment safety rules -		_____	_____																																				
3. Reviewed procedure for removal -		_____	_____																																				
4. Removed bearing -		_____	_____																																				
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6. Installed new bearing -		_____	_____																																				
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8. Tested operation -		_____	_____																																				
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																																							
Tools and Equipment:	Resources:																																						

Duty: Servicing and Repairing Four-Cycle Engines		Duty No. E																								
		Task No. 32																								
Task: Service governor systems, using appropriate equipment, to maintain operating condition.																										
Achievement Indicators:	The learner:	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 80%;"></th> <th style="width: 10%; text-align: center;">Yes</th> <th style="width: 10%; text-align: center;">No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>3. Listed basic styles of governors -</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>4. Described basic functions of governor -</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>5. Checked governor functions -</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>6. Adjusted to manufacturer's specifications -</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>7. Tested final operation -</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> </tbody> </table>		Yes	No	1. Followed personal safety rules -	_____	_____	2. Followed equipment safety rules -	_____	_____	3. Listed basic styles of governors -	_____	_____	4. Described basic functions of governor -	_____	_____	5. Checked governor functions -	_____	_____	6. Adjusted to manufacturer's specifications -	_____	_____	7. Tested final operation -	_____	_____
	Yes	No																								
1. Followed personal safety rules -	_____	_____																								
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																										
Tools and Equipment:	Resources:																									

Duty: Servicing and Repairing Four-Cycle Engines		Duty No. E	
		Task No. 33	
Task: Inspect flywheel key, using appropriate materials, to determine wear or damage.			
Achievement indicators:	The learner:	Yes	No
1. Listed cause of "sheared" key -		_____	_____
2. Inspected key surface for damage -		_____	_____
3. Inspected flywheel keyway for damage -		_____	_____
4. Inspected P.T.O. keyway for damage -		_____	_____
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.			
Tools and Equipment:	Resources:		

Duty: Servicing and Repairing Four-Cycle Engines		Duty No. E																					
		Task No. 34																					
Task: Lap flywheel, using appropriate equipment, to re-seat.																							
<table border="0"> <tr> <td>Achievement Indicators:</td> <td>The learner:</td> <td>Yes</td> <td>No</td> </tr> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Selected appropriate lapping compound -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Lapped flywheel until taper is seated -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Cleaned flywheel and taper free of grit -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Selected appropriate lapping compound -		_____	_____	3. Lapped flywheel until taper is seated -		_____	_____	4. Cleaned flywheel and taper free of grit -		_____	_____
Achievement Indicators:	The learner:	Yes	No																				
1. Followed personal safety rules -		_____	_____																				
2. Selected appropriate lapping compound -		_____	_____																				
3. Lapped flywheel until taper is seated -		_____	_____																				
4. Cleaned flywheel and taper free of grit -		_____	_____																				
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																							
Tools and Equipment:	Resources:																						

Duty: Servicing and Repairing Four-Cycle Engines		Duty No. E	
		Task No. 35	
Task: Ridge ream cylinder, using appropriate equipment, to remove ridge restricting removal of piston.			
Achievement indicators:	The learner:	Yes	No
1. Followed personal safety rules -		_____	_____
2. Followed equipment safety rules -		_____	_____
3. Adjusted reamer to correct diameter -		_____	_____
4. Removed ridge -		_____	_____
5. Cleaned shavings -		_____	_____
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.			
Tools and Equipment:	Resources:		
	167		

Duty: Service and Repair Four-Cycle Engines		Duty No. E
		Task No. 36
Task: Bore cylinder, using appropriate equipment, to resize cylinder to new specifications.		
Achievement Indicators:	The learner:	Yes No
1. Followed personal safety rules -		_____
2. Followed equipment safety rules -		_____
3. Determined by inspection the need for resizing -		_____
4. Measured cylinder and compared to manufacturer's specifications -		_____
5. Secured oversize piston of proper size -		_____
6. Measured piston to determine bore size -		_____
7. Added cylinder/piston clearance as per manufacturer's specifications-		_____
8. Oiled cylinder to prevent corrosion -		_____
9. Bored cylinder to size within .001 tolerance -		_____
10. Honed cylinder to size and pattern -		_____
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.		
Tools and Equipment:	Resources:	
	168	

Duty: Servicing and Repairing Four-Cycle Engines

Duty No. E

Task No. 37

Task: Hone cylinder, using appropriate equipment, to resurface cylinder to specifications.

Achievement Indicators:

The learner:

Yes

No

1. Followed personal safety rules -
2. Followed equipment safety rules -
3. Measured cylinder to determine if "out of round" -
4. Measured cylinder to determine if worn beyond manufacturer's specifications -
5. Hone cylinder using "Figure 8" or cross hatch pattern -
6. Clean cylinder using appropriate material -
7. Oil cylinder to prevent corrosion -

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing and Repairing Four-Cycle Engines**Duty No.** E**Task No.** 38**Task:** Remove/install seal, using appropriate tools, to restore engine to operating condition.**Achievement Indicators:**

The learner:

Yes

No

1. Followed personal safety rules -
2. Followed equipment safety rules -
3. Prepared area for seal removal -
4. Removed seal -
5. Installed seal -
6. Checked operation -
7. Performed seal leakage test -

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.**Tools and Equipment:****Resources:**

Duty: Servicing and Repairing Four-Cycle Engines		Duty No. E																																									
		Task No. 39																																									
Task: Perform an engine tune-up, using appropriate equipment, to return engine to maximum performance.																																											
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Reviewed tune-up procedure for particular engine style -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Performed basic engine tune-up as required -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Changed engine oil -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Serviced equipment as required -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Tested engine performance -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>8. Performed final adjustments -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>9. Performed final clean up -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Followed equipment safety rules -		_____	_____	3. Reviewed tune-up procedure for particular engine style -		_____	_____	4. Performed basic engine tune-up as required -		_____	_____	5. Changed engine oil -		_____	_____	6. Serviced equipment as required -		_____	_____	7. Tested engine performance -		_____	_____	8. Performed final adjustments -		_____	_____	9. Performed final clean up -		_____	_____
Achievement Indicators:	The learner:	Yes	No																																								
1. Followed personal safety rules -		_____	_____																																								
2. Followed equipment safety rules -		_____	_____																																								
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8. Performed final adjustments -		_____	_____																																								
9. Performed final clean up -		_____	_____																																								
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																																											
Tools and Equipment:		Resources:																																									

Duty: Servicing and Repairing Four-Cycle Engines

Duty No. F

Task No. 40

Task: Prepare engine for storage, using appropriate materials, to prevent damage to engine.

Achievement Indicators:

The learner:

Yes

No

1. Removed battery where applicable -
2. Removed spark plug and added oil to cylinder -
3. Reinstalled spark plug -
4. Turned off fuel shutoff -
5. Started engine and used all fuel in carburetor and fuel line -
6. Added storage additive to fuel tank -
7. Covered engine to prevent moisture build-up -

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing and Repairing Exhaust Systems

Duty No. E

Task No. 41

Task: Service exhaust system, using appropriate equipment, to maintain operating condition.

Achievement Indicators:

The learner:

Yes

No

1. Followed personal safety rules -
2. Followed equipment safety rules -
3. Removed muffler -
4. Inspected muffler for obstructions -
5. Inspected exhaust ports -
6. Rethreaded mounting bolts -
7. Checked exhaust system for restrictions -
8. Checked exhaust system for leaks -

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing and Repairing Ignition Systems		Duty No. F																	
		Task No. 1																	
Task: Diagram ignition system, using appropriate materials, to show location of major components.																			
<table border="0"> <tr> <td>Achievement indicators:</td> <td>The learner:</td> <td>Yes</td> <td>No</td> </tr> <tr> <td>1. Listed basic ignition parts -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Listed symbol for each part -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Constructed schematic of basic system -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </table>				Achievement indicators:	The learner:	Yes	No	1. Listed basic ignition parts -		_____	_____	2. Listed symbol for each part -		_____	_____	3. Constructed schematic of basic system -		_____	_____
Achievement indicators:	The learner:	Yes	No																
1. Listed basic ignition parts -		_____	_____																
2. Listed symbol for each part -		_____	_____																
3. Constructed schematic of basic system -		_____	_____																
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																			
Tools and Equipment:	Resources:																		

Teacher Activities	Student Learning Activities
1. Use transparency to show and explain ignition system. 2. Provide symbols - sheet drawings - of ignition system parts. 3. Show sample of ignition system schematic. 4. Take students through step by step of a diagram of ignition system.	1. Listen and observe diagram of ignition system. 2. Copy symbols used in ignition system diagrams. 3. Follow diagram of ignition system. 4. Construct a diagram of an ignition system. 175

Duty: Servicing and Repairing Ignition Systems

Duty No. F

Task No. 2

Task: Inspect ignition system, using appropriate tools, to check for serviceability.

Achievement Indicators:

The learner:

Yes

No

1. Followed personal safety rules -
2. Followed equipment safety rules -
3. Inspected point gap setting -
4. Inspected point surface condition -
5. Inspected ignition timing (where applicable) -
6. Inspected coil and performed appropriate tests -
7. Inspected condenser and performed appropriate tests -

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing and Repairing Ignition Systems**Duty No.** F**Task No.** 3**Task:** Inspect ignition system parts, using appropriate equipment to determine wear and serviceability.**Achievement Indicators:**

The learner:

Yes

No

- | | | |
|--|-------|-------|
| 1. Inspected recoil and blower housing for cracks and smooth operation - | _____ | _____ |
| 2. Checked flywheel (Briggs) air gap - | _____ | _____ |
| 3. Inspected flywheel for crack in keyway - | _____ | _____ |
| 4. Inspected flywheel key for shearing - | _____ | _____ |
| 5. Checked point air gap - | _____ | _____ |
| 6. Inspected point surface wear - | _____ | _____ |
| 7. Inspected condenser - | _____ | _____ |
| 8. Inspected high tension wire - | _____ | _____ |
| 9. Inspected all wires for cracks - | _____ | _____ |
| 10. Inspected magneto - | _____ | _____ |
| 11. Inspected plunger (Briggs) - | _____ | _____ |
| 12. Inspected breaker cam (Tecumseh) - | _____ | _____ |
| 13. Checked timing (Tecumseh) - | _____ | _____ |
| 14. Performed coil/magneto tests as required by manufacturer - | _____ | _____ |

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.**Tools and Equipment:****Resources:**

Duty: Servicing and Repairing Ignition Systems**Duty No.** F**Task No.** 4**Task:** Perform a coil power test, using appropriate equipment, to determine operating amperage of coil.**Achievement Indicators:**

The learner:

Yes

No

1. Followed personal safety rules -
2. Followed equipment safety rules -
3. Reviewed operation of coil -
4. Reviewed operation of coil tester -
5. Tested coil as per operator's manual for tester -
6. Compared reading to manufacturer's specification -

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.**Tools and Equipment:****Resources:**

Duty: Servicing and Repairing Ignition Systems

Duty No. F

Task No. 5

Task: Perform a coil high speed test, using appropriate equipment, to determine maximum output and load failure.

Achievement Indicators:

The learner:

Yes

No

1. Followed personal safety rules -
2. Followed equipment safety rules -
3. Reviewed operation of coil -
4. Reviewed operation of coil tester -
5. Performed high speed test per operator's manual -

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing and Repairing Ignition Systems		Duty No. F																									
		Task No. 6																									
Task: Perform coil surface insulation test, using appropriate equipment, to determine leaks in coil insulation.																											
<table border="0"> <tr> <td>Achievement indicators:</td> <td>The learner:</td> <td>Yes</td> <td>No</td> </tr> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Reviewed operation of coil -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Reviewed operation of coil tester -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Tested as per operator's manual -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </table>				Achievement indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Followed equipment safety rules -		_____	_____	3. Reviewed operation of coil -		_____	_____	4. Reviewed operation of coil tester -		_____	_____	5. Tested as per operator's manual -		_____	_____
Achievement indicators:	The learner:	Yes	No																								
1. Followed personal safety rules -		_____	_____																								
2. Followed equipment safety rules -		_____	_____																								
3. Reviewed operation of coil -		_____	_____																								
4. Reviewed operation of coil tester -		_____	_____																								
5. Tested as per operator's manual -		_____	_____																								
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																											
Tools and Equipment:		Resources:																									

Duty: Servicing and Repairing Ignition Systems		Duty No. F														
		Task No. 7														
Task: Perform coil continuity test using appropriate equipment to determine continuity value.																
Achievement indicators:	The learner:	<table border="1"> <thead> <tr> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </tbody> </table>	Yes	No	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Yes	No															
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																
Tools and Equipment:	Resources:															

Duty: Servicing and Repairing Ignition Systems

Duty No. F

Task No. 8

Task: Perform primary resistance test, using appropriate equipment, to determine
 mine value of coil primary circuit.

Achievement Indicators:

The learner:

Yes

No

1. Followed personal safety rules -
2. Followed equipment safety rules -
3. Reviewed primary resistance -
4. Reviewed operation of tester -
5. Tested as per operator's manual -
6. Compared to manufacturer's specifications -

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing and Repairing Ignition Systems		Duty No. F Task No. 9																			
Task: Perform coil ground test, using appropriate equipment, to determine proper grounding of coil.																					
Achievement Indicators:		<table border="0"> <thead> <tr> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Reviewed operation of coil -</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Reviewed operation of tester -</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Tested as per operator's manual -</td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>		The learner:	Yes	No	1. Followed personal safety rules -	_____	_____	2. Followed equipment safety rules -	_____	_____	3. Reviewed operation of coil -	_____	_____	4. Reviewed operation of tester -	_____	_____	5. Tested as per operator's manual -	_____	_____
The learner:	Yes	No																			
1. Followed personal safety rules -	_____	_____																			
2. Followed equipment safety rules -	_____	_____																			
3. Reviewed operation of coil -	_____	_____																			
4. Reviewed operation of tester -	_____	_____																			
5. Tested as per operator's manual -	_____	_____																			
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																					
Tools and Equipment:	Resources:																				

Duty: Servicing and Repairing Ignition Systems

Duty No. F

Task No. 10

Task: Check condenser capacity, using appropriate equipment, to determine value.

Achievement Indicators:

The learner:

Yes

No

1. Followed personal safety rules -
2. Followed equipment safety rules -
3. Reviewed operation of condenser -
4. Reviewed operation of tester -
5. Tested as per operator's manual -
6. Compared to manufacturer's specifications -

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing and Repairing Ignition Systems

Duty No. F

Task No. 11

Task: Perform condenser leakage and short test, using appropriate equipment, to determine reliability of condenser.

Achievement Indicators:

The learner:

Yes

No

1. Followed personal safety rules -
2. Followed equipment safety rules -
3. Reviewed operation of condenser -
4. Reviewed operation of tester -
5. Tested as per operator's manual -

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing and Repairing Ignition Systems		Duty No. F														
		Task No. 12														
Task: Perform condenser series resistance test, using appropriate equipment, to determine reliability of condenser.																
Achievement indicators:	The learner:	<table border="1"> <thead> <tr> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </tbody> </table>	Yes	No	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Yes	No															
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																
Tools and Equipment:	Resources:															

Duty: Servicing and Repairing Ignition Systems		Duty No. F	
		Task No. 13	
Task: Measure resistance of breaker points, using appropriate equipment, to determine resistance and wearability of points.			
Achievement indicators:	The learner:	Yes	No
1. Followed personal safety rules -		_____	_____
2. Followed equipment safety rules -		_____	_____
3. Reviewed operation of breaker points -		_____	_____
4. Reviewed operation of tester -		_____	_____
5. Tested as per operator's manual -		_____	_____
6. Compared to manufacturer's specifications -		_____	_____
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.			
Tools and Equipment:	Resources:		

Duty: Servicing and Repairing Ignition Systems		Duty No. F																																
		Task No. 14																																
Task: Test spark plug wire, using appropriate equipment, to detect resistance outside of specifications.																																		
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Referred to manufacturer's repair manual for specifications -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Removed parts as required to expose wire -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Removed spark plug wire from spark plug -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Measured resistance from cap terminal to spark plug terminal -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Compared reading with manufacturer's specifications -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Replaced any wire that did not meet manufacturer's specifications -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Replaced parts -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>			Achievement Indicators:	The learner:	Yes	No	1. Referred to manufacturer's repair manual for specifications -		_____	_____	2. Removed parts as required to expose wire -		_____	_____	3. Removed spark plug wire from spark plug -		_____	_____	4. Measured resistance from cap terminal to spark plug terminal -		_____	_____	5. Compared reading with manufacturer's specifications -		_____	_____	6. Replaced any wire that did not meet manufacturer's specifications -		_____	_____	7. Replaced parts -		_____	_____
Achievement Indicators:	The learner:	Yes	No																															
1. Referred to manufacturer's repair manual for specifications -		_____	_____																															
2. Removed parts as required to expose wire -		_____	_____																															
3. Removed spark plug wire from spark plug -		_____	_____																															
4. Measured resistance from cap terminal to spark plug terminal -		_____	_____																															
5. Compared reading with manufacturer's specifications -		_____	_____																															
6. Replaced any wire that did not meet manufacturer's specifications -		_____	_____																															
7. Replaced parts -		_____	_____																															
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																																		
Tools and Equipment:		Resources:																																

Duty: Servicing and Repairing Ignition Systems

Duty No. F

Task No. 15

Task: Inspect ignition timing, using appropriate materials, to determine setting (stator plate style).

Achievement Indicators:

The learner:

Yes

No

1. Followed personal safety rules -
2. Followed equipment safety rules -
3. Listed procedure for timing (stator plate type) -
4. Checked timing B.T.D.C. -
5. Recorded timing -
6. Compared to manufacturer's specifications -

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing and Repairing Ignition Systems		Duty No. F																																													
		Task No. 16																																													
Task: Test ignition timing, using appropriate equipment, to detect any deviation in setting.																																															
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Tools and Equipment:		Resources:																																													
		190																																													

Duty: Servicing and Repairing Ignition Systems		Duty No. F																																																	
		Task No. 17																																																	
Task: Adjust ignition timing, using appropriate equipment, to restore ignition timing to manufacturer's specifications.																																																			
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Duty: Servicing and Repairing Ignition Systems		Duty No. F
		Task No. 18
Task: Inspect breaker cam, using appropriate materials, to determine wear and serviceability.		
Achievement Indicators:	The learner:	Yes No
1. Listed removal procedure -		_____
2. Inspected for proper installation -		_____
3. Inspected cam lobe for wear -		_____
4. Inspected cam for cracks, rough surface -		_____
5. Inspected locator key for damage -		_____
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.		
Tools and Equipment:	Resources:	
	192	

Duty: Servicing and Repairing Ignition Systems

Duty No. F

Task No. 19

Task: Inspect breaker plunger, using appropriate materials, to check for wear and serviceability.

Achievement Indicators:

The learner:

Yes

No

1. Listed function of breaker plunger -
2. Inspected surface condition -
3. Measured with reject gauge plunger hole diameter -
4. Checked area for oil leakage -

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing and Repairing Ignition Systems

Duty No. F

Task No. 20

Task: Replace condenser, using appropriate equipment to restore condenser operation.

Achievement Indicators:

The learner:

Yes

No

1. Removed parts as required to expose condenser -
2. Loosened lead screw and detached lead from contact set -
3. Removed condenser -
4. Wiped stator plate clean and oil lever post (if necessary) -
5. Installed new condenser attached leads -
6. Tightened all screws -
7. Checked condenser ground connection -
8. Started engine to performance test points and condenser -

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing and Repairing Ignition Systems**Duty No.** F**Task No.** 2**Task:** Replace ignition points, using appropriate equipment, to restore point operation.**Achievement Indicators:**

The learner:

Yes

No

1. Referred to manufacturer's repair manual for specifications needed to replace ignition points - ☐ ☐
2. Removed parts as needed to expose points - ☐ ☐
3. Loosened lead screw and detached leads - ☐ ☐
4. Loosened screws holding contact set to stator plate - ☐ ☐
5. Slipped contact set out from under screws - ☐ ☐
6. Wiped stator plate clean and oil lever post (if present) - ☐ ☐
7. Installed new contacts, attached leads, and adjusted point opening making sure contacts are properly aligned - ☐ ☐
8. Tightened all screws and rechecked point opening - ☐ ☐
9. Started engine to performance test points and condenser - ☐ ☐
10. Tested dwell and readjusted if necessary - ☐ ☐
11. Tested ignition timing, adjusted if necessary - ☐ ☐

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.**Tools and Equipment:****Resources:**

Duty: Servicing and Repairing Ignition Systems		Duty No. F																									
		Task No. 22																									
Task: Adjust air gap magneto to flywheel, using appropriate tools, to maintain operating condition.																											
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>3. Determined manufacturer's specifications -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>4. Moved magneto to correct setting -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>5. Rotated flywheel and rechecked -</td> <td></td> <td>☐</td> <td>☐</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		☐	☐	2. Followed equipment safety rules -		☐	☐	3. Determined manufacturer's specifications -		☐	☐	4. Moved magneto to correct setting -		☐	☐	5. Rotated flywheel and rechecked -		☐	☐
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Tools and Equipment:		Resources:																									

Duty: Servicing and Repairing Ignition Systems		Duty No. F
		Task No. 21
Task: Inspect condition of spark plugs, using appropriate materials, to determine engine operating condition.		
Achievement Indicators:	The learner:	Yes No
1. Reviewed chart on spark plug failures -	_____	_____
2. Listed common spark plug failures -	_____	_____
3. Listed engine conditions causing spark plug failure -	_____	_____
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.		
Tools and Equipment:	Resources:	
	197	

Duty: Servicing and Repairing Ignition Systems

Duty No. F

Task No. 24

Task: Clean spark plugs, using appropriate equipment, to remove all carbon from electrode insulator and shell.

Achievement Indicators:

The learner:

Yes

No

1. Referred to manufacturer's repair manual for procedure to clean spark plugs (NOTE: Some manufacturers do not recommend cleaning spark plugs.) -
2. Inspected for broken insulators and damaged threads -
3. Examined deposits and condition of electrodes -
4. Cleaned threads with wire brush -
5. Removed all deposits with spark plug cleaner -
6. Filed electrodes to obtain flat surface -
7. Regapped spark plug to specifications -
8. Cleaned plugs with solvent and dried thoroughly with compressed air -
9. Replaced old gaskets with new ones -

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing and Repairing Ignition Systems

Duty No. F

Task No. 25

Task: Gap spark plugs, using appropriate equipment, to set electrode gap.

Achievement Indicators:

The learner:

Yes

No

1. Referred to manufacturer's repair manual for specifications and procedure to gap spark plugs -
2. Gapped each spark plug to specifications -
3. Bent side electrode to proper gap -
4. Checked to be sure electrodes are parallel -
5. Rechecked spark plug with wire feeler gauge -

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing and Repairing Ignition Systems

Duty No. F

Task No. 26

Task: Replace spark plugs using appropriate equipment to restore spark plug operation.

Achievement Indicators:

The learner:

Yes

No

1. Referred to manufacturer's repair manual for specifications and procedure to replace spark plugs - ☐ ☐
2. Disconnected wires from spark plugs - ☐ ☐
3. Loosened plugs and blew dirt from base of plug - ☐ ☐
4. Removed spark plugs keeping them in the order in which they were removed - ☐ ☐
5. Inspected plug for proper operation - ☐ ☐
6. Selected correct replacement spark plugs - ☐ ☐
7. Gapped spark plugs to specifications - ☐ ☐
8. Lubricated new threads lightly with engine oil if applicable - ☐ ☐
9. Installed spark plugs - ☐ ☐
10. Torqued all spark plugs to specifications - ☐ ☐
11. Reinstalled spark plug wires - ☐ ☐
12. Started engine and checked operations - ☐ ☐

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing and Repairing Electrical Systems		Duty No. G																									
				Task No. 1																							
Task: Solve equations involving Ohm's Law, using appropriate materials, to find amperes, volts or ohms.																											
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Reviewed Ohm's Law formula -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Reviewed amperes (I) -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Reviewed volts (E) -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Reviewed ohms (R) or resistance -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Solved three problems involving Ohm's Law -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Reviewed Ohm's Law formula -		_____	_____	2. Reviewed amperes (I) -		_____	_____	3. Reviewed volts (E) -		_____	_____	4. Reviewed ohms (R) or resistance -		_____	_____	5. Solved three problems involving Ohm's Law -		_____	_____
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Tools and Equipment:		Resources:																									

Teacher Activities	Student Learning Activities
1. Give hand out on Ohm's Law. 2. Explain Ohm's Law - show examples. 3. Give practice problems sheet. 4. Correct in class.	1. Obtain hand out on Ohm's Law. 2. Listen to lecture and examples. 3. Practice formula's using problem sheet. 4. Correct errors in problem sheet. 202

Duty: Servicing and Repairing Electrical Systems		Duty No. 6													
		Task No. 2													
Task: Locate electrical symbols, using appropriate materials, to identify electrical parts on a schematic.															
<table border="0"> <tr> <td>Achievement Indicators:</td> <td>The learner:</td> <td>Yes</td> <td>No</td> </tr> <tr> <td> 1. Reviewed the following symbols: switch S.P.S.T., switch S.P.D.T., switch P.B.N.O., switch P.B.N.C., resistor, bulb neon, bulb incandescent, battery, cell, ground, coil iron core, transistor, wires crossing not connected, wires crossing connected, capacitor, diode, rectifier, fuse, plug ac - </td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td> 2. Labeled above parts on a schematic - </td> <td></td> <td>_____</td> <td>_____</td> </tr> </table>				Achievement Indicators:	The learner:	Yes	No	1. Reviewed the following symbols: switch S.P.S.T., switch S.P.D.T., switch P.B.N.O., switch P.B.N.C., resistor, bulb neon, bulb incandescent, battery, cell, ground, coil iron core, transistor, wires crossing not connected, wires crossing connected, capacitor, diode, rectifier, fuse, plug ac -		_____	_____	2. Labeled above parts on a schematic -		_____	_____
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.															
Tools and Equipment:		Resources:													

Duty: Servicing and Repairing Electrical Systems

Duty No. G

Task No. 3

Task: Wire a series circuit, using appropriate materials, to identify and isolate paths of current.

Achievement Indicators:

The learner:

Yes

No

1. Followed personal safety rules -
2. Reviewed basic series circuits -
3. Wired two or more light bulbs in series to an appropriate power source -
4. Identified three or more series circuits on various schematics -

_____	_____
_____	_____
_____	_____
_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing and Repairing Electrical Systems

Duty No. G

Task No. 4

Task: Wire a parallel circuit, using appropriate materials, to identify and isolate paths of current.

Achievement Indicators:

The learner:

Yes

No

1. Followed personal safety rules -
2. Reviewed basic parallel circuits -
3. Wired two or more light bulbs in parallel to an appropriate power source -
4. Identified three or more parallel circuits on various schematics -

_____	_____
_____	_____
_____	_____
_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing and Repairing Electrical Systems		Duty No. G																													
		Task No. 5																													
Task: Replace light bulbs, using appropriate equipment, to restore light bulbs.																															
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Referred to manufacturer's repair manual for correct procedure for replacing light bulbs -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Removed necessary components to gain access to light bulbs -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Removed light bulb -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Cleaned light bulb socket -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Installed replacement light bulb -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Installed necessary components removed to gain access to bulbs -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Referred to manufacturer's repair manual for correct procedure for replacing light bulbs -		_____	_____	2. Removed necessary components to gain access to light bulbs -		_____	_____	3. Removed light bulb -		_____	_____	4. Cleaned light bulb socket -		_____	_____	5. Installed replacement light bulb -		_____	_____	6. Installed necessary components removed to gain access to bulbs -		_____	_____
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Tools and Equipment:	Resources:																														

Duty: Servicing and Repairing Electrical Systems		Duty No. G																								
		Task No. 6																								
Task: Replace bulb sockets, using appropriate equipment, to restore bulb socket operation.																										
Achievement Indicators:	The learner:	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;"></th> <th style="width: 25%; text-align: center;">Yes</th> <th style="width: 25%; text-align: center;">No</th> </tr> </thead> <tbody> <tr> <td>1. Referred to manufacturer's repair manual for correct procedure to replace bulb sockets -</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>2. Removed components necessary to gain access to bulb sockets -</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>3. Removed light bulb socket and disconnected electrical leads -</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>4. Installed light bulb socket -</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>5. Reconnected electrical leads -</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>6. Installed components necessary to gain access to bulb sockets -</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>7. Checked operation of replacement light socket -</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> </tbody> </table>		Yes	No	1. Referred to manufacturer's repair manual for correct procedure to replace bulb sockets -	_____	_____	2. Removed components necessary to gain access to bulb sockets -	_____	_____	3. Removed light bulb socket and disconnected electrical leads -	_____	_____	4. Installed light bulb socket -	_____	_____	5. Reconnected electrical leads -	_____	_____	6. Installed components necessary to gain access to bulb sockets -	_____	_____	7. Checked operation of replacement light socket -	_____	_____
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																										
Tools and Equipment:	Resources:																									

Duty: Servicing and Repairing Electrical Systems

Duty No. G

Task No. 7

Task: Test switches, using appropriate equipment, to detect resistance outside of specifications.

Achievement Indicators:

The learner:

Yes

No

1. Referred to manufacturer's repair manual for correct procedure to test switches - _____
2. Performed voltage drop test on switch in use on machine - _____
3. Performed continuity test with an ohmmeter for testing switch out of machine - _____
4. Compared readings with specifications - _____
5. Replaced defective components - _____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing and Repairing Electrical Systems		Duty No. G																																					
		Task No. 8																																					
Task: Replace switches, using appropriate equipment, to restore switch operation.																																							
<table border="0"> <tr> <td>Achievement Indicators:</td> <td>The learner:</td> <td>Yes</td> <td>No</td> </tr> <tr> <td>1. Referred to manufacturer's repair manual for correct procedure to replace switches -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Disconnected negative (-) battery cable -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Disconnected electrical leads from switch -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Removed switch -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Installed replacement switch -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Connected electrical leads to replacement switch -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Connected negative (-) battery cable -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>8. Tested operation of switch -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </table>				Achievement Indicators:	The learner:	Yes	No	1. Referred to manufacturer's repair manual for correct procedure to replace switches -		_____	_____	2. Disconnected negative (-) battery cable -		_____	_____	3. Disconnected electrical leads from switch -		_____	_____	4. Removed switch -		_____	_____	5. Installed replacement switch -		_____	_____	6. Connected electrical leads to replacement switch -		_____	_____	7. Connected negative (-) battery cable -		_____	_____	8. Tested operation of switch -		_____	_____
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Tools and Equipment:	Resources:																																						

Duty: Servicing and Repairing Electrical Systems		Duty No. G										
		Task No. 9										
Task: Test fuses, using appropriate equipment, to detect open fuses.												
Achievement Indicators:	The learner:	<table border="1"> <thead> <tr> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </tbody> </table>	Yes	No	_____	_____	_____	_____	_____	_____	_____	_____
Yes	No											
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Tools and Equipment:	Resources:											

Duty: Servicing and Repairing Electrical Systems		Duty No. G																									
		Task No. 10																									
Task: Replace fuses, using appropriate equipment, to restore fuse operation.																											
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Referred to manufacturer's repair manual for correct procedure to replace fuses -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Removed fuse from holder -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Selected proper replacement fuse -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Installed replacement fuse -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Checked for proper operation -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Referred to manufacturer's repair manual for correct procedure to replace fuses -		_____	_____	2. Removed fuse from holder -		_____	_____	3. Selected proper replacement fuse -		_____	_____	4. Installed replacement fuse -		_____	_____	5. Checked for proper operation -		_____	_____
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Tools and Equipment:		Resources:																									
		211																									

Duty: Servicing and Repairing Electrical Systems		Duty No. G																																	
		Task No. 11																																	
Task: Construct a circuit with a fuse, using appropriate materials, to protect the components of the circuit from overload.																																			
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Reviewed function of a fuse -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Listed universal symbol for fuse -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Reviewed rating system of fuses -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Reviewed selection criteria for a fuse -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Wired a circuit protected by a fuse -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Identified fuses on schematics -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Reviewed function of a fuse -		_____	_____	3. Listed universal symbol for fuse -		_____	_____	4. Reviewed rating system of fuses -		_____	_____	5. Reviewed selection criteria for a fuse -		_____	_____	6. Wired a circuit protected by a fuse -		_____	_____	7. Identified fuses on schematics -		_____	_____
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Tools and Equipment:	Resources:																																		

Duty: Servicing and Repairing Electrical Systems		Duty No. G																													
		Task No. 12																													
Task: Construct a circuit with an ammeter, using appropriate equipment, to measure current flow and load upon the circuit.																															
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Reviewed operation of ammeter -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Selected location of ammeter in circuit -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Tested current flow reactions upon ammeter -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Loaded circuit and noted reading upon ammeter -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Followed equipment safety rules -		_____	_____	3. Reviewed operation of ammeter -		_____	_____	4. Selected location of ammeter in circuit -		_____	_____	5. Tested current flow reactions upon ammeter -		_____	_____	6. Loaded circuit and noted reading upon ammeter -		_____	_____
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																															
Tools and Equipment:	Resources:																														

Duty: Servicing and Repairing Electrical Systems		Duty No. G																									
		Task No. 13																									
Task: Construct a circuit with a switch, using appropriate materials, to turn a light on and off.																											
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Reviewed function of a switch -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Listed universal symbols for switches -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Reviewed styles of switches -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Wired a circuit controlled by a switch to turn a light on/off -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Reviewed function of a switch -		_____	_____	3. Listed universal symbols for switches -		_____	_____	4. Reviewed styles of switches -		_____	_____	5. Wired a circuit controlled by a switch to turn a light on/off -		_____	_____
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Tools and Equipment:	Resources:																										

Duty: Servicing and Repairing Electrical Systems		Duty No. G																									
		Task No. 14																									
Task: Bypass a switch, using appropriate materials, to determine possible switch failure.																											
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Reviewed function and operation of a switch -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Jumped the switch and tested operation of circuit -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Determined reliability of switch -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Followed equipment safety rules -		_____	_____	3. Reviewed function and operation of a switch -		_____	_____	4. Jumped the switch and tested operation of circuit -		_____	_____	5. Determined reliability of switch -		_____	_____
Achievement Indicators:	The learner:	Yes	No																								
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Tools and Equipment:	Resources: 215																										

Duty: Servicing and Repairing Electrical Systems		Duty No. G																													
		Task No. 15																													
Task: Test battery, using hydrometer, to detect any cell with specific gravity less than 1.220.																															
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Referred to manufacturer's repair manual for correct procedure to test battery using hydrometer -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Removed vent caps -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Measured and recorded specific gravity and temperature of each cell -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Adjusted reading to temperature -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Recorded any cell less than 1.220 -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Installed vent caps -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Referred to manufacturer's repair manual for correct procedure to test battery using hydrometer -		_____	_____	2. Removed vent caps -		_____	_____	3. Measured and recorded specific gravity and temperature of each cell -		_____	_____	4. Adjusted reading to temperature -		_____	_____	5. Recorded any cell less than 1.220 -		_____	_____	6. Installed vent caps -		_____	_____
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Tools and Equipment:	Resources:																														

Duty: Servicing and Repairing Electrical Systems		Duty No. G												
		Task No. 16												
Task: Test battery electrolyte level, using appropriate equipment, to detect any deviation from manufacturer's specifications.														
Achievement Indicators:	The learner:	<table border="1"> <thead> <tr> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </tbody> </table>	Yes	No	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Yes	No													
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.														
Tools and Equipment:	Resources:													

Duty: Servicing and Repairing Electrical Systems		Duty No. G												
		Task No. 17												
Task: Test battery voltage, using appropriate equipment, to detect a low voltage condition.														
Achievement Indicators:	The learner:	<table border="1"> <thead> <tr> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </tbody> </table>	Yes	No	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.														
Tools and Equipment:	Resources:													

Duty: Servicing and Repairing Electrical Systems		Duty No. G																								
		Task No. 18																								
Task: Test battery capacity (load), using appropriate equipment, to detect any deviation from manufacturer's specifications.																										
Achievement Indicators:	The learner:	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;"></th> <th style="width: 25%; text-align: center;">Yes</th> <th style="width: 25%; text-align: center;">No</th> </tr> </thead> <tbody> <tr> <td>1. Referred to manufacturer's repair manual for correct procedure for testing battery capacity -</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>2. Tested voltage and specific gravity -</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>3. Connected voltmeter ampmeter and carbon pile load to battery -</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>4. Referred to battery maker's specifications to determine proper load: a. Multiplied the ampere-hour rating by three b. Divided cold cranking rating by two </td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>5. Turned carbon pile control knob to draw battery current established in step 4 for 15 seconds -</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>6. Checked voltmeter during test (battery voltage should not fall below 9.6 V for 12 volts or 4.8 V for 6 volt battery) -</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>7. Recharged or replaced battery as required -</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> </tbody> </table>		Yes	No	1. Referred to manufacturer's repair manual for correct procedure for testing battery capacity -	_____	_____	2. Tested voltage and specific gravity -	_____	_____	3. Connected voltmeter ampmeter and carbon pile load to battery -	_____	_____	4. Referred to battery maker's specifications to determine proper load: a. Multiplied the ampere-hour rating by three b. Divided cold cranking rating by two	_____	_____	5. Turned carbon pile control knob to draw battery current established in step 4 for 15 seconds -	_____	_____	6. Checked voltmeter during test (battery voltage should not fall below 9.6 V for 12 volts or 4.8 V for 6 volt battery) -	_____	_____	7. Recharged or replaced battery as required -	_____	_____
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																										
Tools and Equipment:	Resources:																									

Duty: Servicing and Repairing Electrical Systems

Duty No. G

Task No. 19

Task: Test battery for surface leakage, using appropriate equipment, to detect any deviation from manufacturer's specifications.

Achievement Indicators:

The learner:

Yes

No

1. Referred to manufacturer's repair manual for correct procedure -
2. Connected negative voltmeter lead to ground side of battery -
3. Ran positive voltmeter lead to top of battery -
4. Measured surface leakage (0.2 volts max) -
5. Compared meter readings with specifications -
6. Cleaned surface of battery if readings exceed specifications -

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing and Repairing Electrical Systems		Duty No. G																										
		Task No. 20																										
Task: Charge battery, using appropriate equipment, to restore battery charge.																												
Achievement indicators:	The learner:	<table border="1"> <thead> <tr> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </tbody> </table>	Yes	No	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																												
Tools and Equipment:	Resources:																											

Duty: Servicing and Repairing Electrical Systems

Duty No. G

Task No. 21

Task: Clean battery post and cable connections, using appropriate equipment, to remove corrosion and foreign material.

Achievement Indicators:

The learner:

Yes

No

1. Referred to manufacturer's repair manual for correct procedure to clean battery post and cable connections -
2. Removed ground cable from battery post -
3. Removed positive cable from battery post -
4. Cleaned posts and cables with wire brush -
5. Installed positive cable on positive post -
6. Installed negative cable on negative post -
7. Protected connections with approved sealer -

_____	_____
_____	_____
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_____	_____
_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing and Repairing Electrical Systems

Duty No. G

Task No. 22

Task: Replace battery cables, using appropriate equipment, to restore battery cable operation.

Achievement Indicators:

The learner:

Yes

No

1. Referred to manufacturer's repair manual for correct procedure for replacing battery cables -
2. Removed terminal from battery post (negative then positive) -
3. Removed old cable -
4. Cleaned all contact surfaces -
5. Installed new cable -
6. Tightened all clamps and contact points -
7. Reinstalled battery terminals to battery posts (positive then negative) -
8. Protected connections with approved sealer -

_____	_____
_____	_____
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_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:
Resources:

Duty: Servicing and Repairing Electrical Systems**Duty No.** G**Task No.** 23**Task:** Replace instrument gauges, using appropriate equipment, to restore instrument gauge operation.**Achievement Indicators:**

The learner:

Yes

No

1. Referred to manufacturer's repair manual for correct procedure to replace instrument gauges -
2. Removed all components necessary to gain access to instrument gauges -
3. Disconnected electrical leads from gauge -
4. Removed gauge -
5. Installed replacement gauge -
6. Connected electrical leads to gauge -
7. Reinstalled all components necessary to gain access to gauges -
8. Checked operation of gauge -

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:**Resources:**

Duty: Servicing and Repairing Electrical Systems		Duty No. G
		Task No. 24
Task: Replace constant voltage regulator, using appropriate equipment, to restore constant voltage regulator operation.		
Achievement Indicators:	The learner:	Yes No
1. Referred to manufacturer's repair manual for correct procedure to replace constant voltage regulator -		_____
2. Disconnected electrical leads from regulator -		_____
3. Removed regulator -		_____
4. Installed replacement regulator -		_____
5. Connected electrical leads to regulator -		_____
6. Polarized if required -		_____
7. Checked operating voltage of regulator -		_____
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.		
Tools and Equipment:	Resources:	
	225	

Duty: Servicing and Repairing Electrical Systems

Duty No. G

Task No. 25

Task: Measure voltage in a circuit, using appropriate equipment, to determine current flow.

Achievement Indicators:

The learner:

Yes

No

1. Followed personal safety rules -
2. Followed equipment safety rules -
3. Reviewed operation of ammeter -
4. Measured current flow at appropriate locations -
5. Recorded findings -
6. Compared finding to manufacturer's specifications -

_____	_____
_____	_____
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_____	_____
_____	_____
_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing and Repairing Electrical Systems		Duty No. G																													
		Task No. 26																													
Task: Measure resistance of a circuit, using appropriate equipment, to determine circuit performance.																															
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Reviewed operation of an ohm meter -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Selected appropriate scale -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Measured resistance of circuit -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Compared to manufacturer's specifications -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Followed equipment safety rules -		_____	_____	3. Reviewed operation of an ohm meter -		_____	_____	4. Selected appropriate scale -		_____	_____	5. Measured resistance of circuit -		_____	_____	6. Compared to manufacturer's specifications -		_____	_____
Achievement Indicators:	The learner:	Yes	No																												
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6. Compared to manufacturer's specifications -		_____	_____																												
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																															
Tools and Equipment:		Resources:																													

Duty: Servicing and Repairing Electrical Systems

Duty No. G

Task No. 27

Task: Test ground system resistance, using appropriate equipment, to detect resistance in the circuit.

Achievement Indicators:

The learner:

Yes

No

1. Referred to manufacturer's repair manual for correct procedure to test ground system resistance -
2. Connected remotestarter switch -
3. Connected voltmeter positive lead to starter motor housing -
4. Connected voltmeter negative lead to negative battery terminal -
5. Cranked engine and noted voltmeter reading -
6. Compared voltmeter reading specifications (usually .1 to .3 volts) -
7. Replaced or cleaned and tightened all system ground connections if reading exceeded specifications -

_____	_____
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_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing and Repairing Electrical Systems	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Duty No. G</td> </tr> <tr> <td style="padding: 2px;">Task No. 28</td> </tr> </table>	Duty No. G	Task No. 28																																																		
Duty No. G																																																					
Task No. 28																																																					
Task: Test charging system output, using appropriate equipment, to detect any deviation from manufacturer's specifications for output.																																																					
<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; width: 45%;">Achievement Indicators:</th> <th style="text-align: left; width: 30%;">The learner:</th> <th style="text-align: center; width: 10%;">Yes</th> <th style="text-align: center; width: 15%;">No</th> </tr> </thead> <tbody> <tr> <td>1. Referred to manufacturer's repair manual for correct procedure to test charging system -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>2. Referred to manufacturer's service information to determine specifications for charging circuit -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>3. Referred to test equipment manufacturer operating instructions to determine testing procedure -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>4. Tested belt tension -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>5. Connected charging system test to machine -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>6. Read rate of discharge on ammeter with engine off and ignition switch on -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>7. Started engine and adjusted speed to manufacturer's specifications -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>8. Adjusted load control slowly as required to obtain highest ampere reading -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>9. Added manufacturer's readings in steps 5 and 7 and compared to manufacturer's specifications -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>10. Repeated steps 5-9 with field energized if readings were not within specifications -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>11. Replaced charging unit if charging system failed test no. 9 -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>12. Replaced regulator if charging system failed test no. 9 -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> </tbody> </table>		Achievement Indicators:	The learner:	Yes	No	1. Referred to manufacturer's repair manual for correct procedure to test charging system -		_____	_____	2. Referred to manufacturer's service information to determine specifications for charging circuit -		_____	_____	3. Referred to test equipment manufacturer operating instructions to determine testing procedure -		_____	_____	4. Tested belt tension -		_____	_____	5. Connected charging system test to machine -		_____	_____	6. Read rate of discharge on ammeter with engine off and ignition switch on -		_____	_____	7. Started engine and adjusted speed to manufacturer's specifications -		_____	_____	8. Adjusted load control slowly as required to obtain highest ampere reading -		_____	_____	9. Added manufacturer's readings in steps 5 and 7 and compared to manufacturer's specifications -		_____	_____	10. Repeated steps 5-9 with field energized if readings were not within specifications -		_____	_____	11. Replaced charging unit if charging system failed test no. 9 -		_____	_____	12. Replaced regulator if charging system failed test no. 9 -		_____	_____
Achievement Indicators:	The learner:	Yes	No																																																		
1. Referred to manufacturer's repair manual for correct procedure to test charging system -		_____	_____																																																		
2. Referred to manufacturer's service information to determine specifications for charging circuit -		_____	_____																																																		
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Criteria:

Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:**Resources:**

Duty: Servicing and Repairing Electrical Systems

Duty No. G

Task No. 29

Task: Test constant voltage regulator, using appropriate equipment, to detect operation outside manufacturer's specifications.

Achievement Indicators:

The learner:

Yes

No

1. Referred to manufacturer's repair manual for correct procedure to test constant voltage regulator -
2. Checked operating voltage of regulator unit -
3. Compared voltage reading to specifications -
4. Replaced voltage regulator if readings were not within specifications -

_____	_____
_____	_____
_____	_____
_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:
Resources:

Duty: Servicing and Repairing Electrical Systems		Duty No. G										
		Task No. 30										
Task: Test instrument gauges, using appropriate equipment, to detect operation outside manufacturer's specifications.												
Achievement Indicators:	The learner:	<table border="1"> <thead> <tr> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </tbody> </table>	Yes	No	_____	_____	_____	_____	_____	_____	_____	_____
Yes	No											
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_____	_____											
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.												
Tools and Equipment:	Resources:											

Duty: Servicing and Repairing Electrical Systems		Duty No. G																											
		Task No. 31																											
Task: Adjust voltage regulator, using appropriate materials, to maintain safe operating condition.																													
Achievement indicators:	The learner:	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;"></th> <th style="width: 20%; text-align: center;">Yes</th> <th style="width: 20%; text-align: center;">No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>3. Identified unit being serviced -</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>4. Secured operational/test manual -</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>5. Located test procedure -</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>6. Performed test procedure -</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>7. Adjusted to required specifications -</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>8. Re-tested to varify settings -</td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> </tbody> </table>		Yes	No	1. Followed personal safety rules -	_____	_____	2. Followed equipment safety rules -	_____	_____	3. Identified unit being serviced -	_____	_____	4. Secured operational/test manual -	_____	_____	5. Located test procedure -	_____	_____	6. Performed test procedure -	_____	_____	7. Adjusted to required specifications -	_____	_____	8. Re-tested to varify settings -	_____	_____
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																													
Tools and Equipment:	Resources:																												

Duty: Servicing and Repairing Lubricating Systems		Duty No. H																									
		Task No. 1																									
Task: Locate oil A.P.I. and S.A.E. codes, using appropriate materials, to identify basic oil types.																											
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Reviewed A.P.I. code system -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Reviewed S.A.E. code system -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Reviewed viscosity -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Reviewed basic types (four) of oil lubricants -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Located codes on oil container -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Reviewed A.P.I. code system -		_____	_____	2. Reviewed S.A.E. code system -		_____	_____	3. Reviewed viscosity -		_____	_____	4. Reviewed basic types (four) of oil lubricants -		_____	_____	5. Located codes on oil container -		_____	_____
Achievement Indicators:	The learner:	Yes	No																								
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																											
Tools and Equipment:	Resources:																										

Teacher Activities	Student Learning Activities
1. Give hand out on oil-code system. 2. Assign chapter in text on oil. 3. Discuss oil and it's code system. 4. Discuss oil and alternatives.	1. Obtain hand out on oil-code system. 2. Read chapter on oil. 3. Discuss oil and its' code system. 4. Discuss oil and alternatives. 235

Duty: Servicing and Repairing Lubricating Systems		Duty No. H
		Task No. 2
Task: Change engine oil, using required tools, to inspect and replenish with fresh lubricant.		
Achievement Indicators:	The learner:	Yes No
1. Followed personal safety precautions -		_____
2. Followed machine safety precautions -		_____
3. Disconnected spark plug wire -		_____
4. Located drain plug -		_____
5. Determined safest/easiest way to drain oil -		_____
6. Drained oil in suitable container -		_____
7. Inspected oil for contaminants -		_____
8. Reinstalled drain plug -		_____
9. Disposed/stored used oil as per safety standards -		_____
10. Refilled engine with proper type/weight oil -		_____
11. Checked fill mark for proper amount -		_____
12. Removed fingerprints and dirt from machine -		_____
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.		
Tools and Equipment:	Resources:	

Duty: Servicing and Repairing Fuel Systems		Duty No. I																									
		Task No. 1																									
Task: Follow safety precautions for gasoline, using appropriate materials, to prevent and avoid fires.																											
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Reviewed properties of gasoline -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Reviewed approved storage container requirements -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Followed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Followed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Reviewed methods of extinguishing a gasoline fire -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Reviewed properties of gasoline -		_____	_____	2. Reviewed approved storage container requirements -		_____	_____	3. Followed personal safety rules -		_____	_____	4. Followed equipment safety rules -		_____	_____	5. Reviewed methods of extinguishing a gasoline fire -		_____	_____
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications																											
Tools and Equipment:	Resources:																										

Teacher Activities	Student Learning Activities
1. Show film on fire prevention in home/shop. 2. Discuss properties of gasoline. 3. Write on board personal and equipment safety rules. 4. Demonstrate use of fire extinguishing equipment.	1. Watch film on fire prevention. 2. Take notes on properties of gasoline. 3. Copy safety rules from board. 4. Practice using fire extinguishers.

Duty: Servicing and Repairing Fuel Systems

Duty No. I

Task No. 2

Task: Disassemble a horizontal float feed carburetor, using appropriate equipment, to inspect and identify parts.

Achievement Indicators:	The learner:	Yes	No
1. Followed personal safety rules -		_____	_____
2. Followed equipment safety rules -		_____	_____
3. Identified style of carburetor -		_____	_____
4. Secured breakdown diagram of particular carburetor -		_____	_____
5. Reviewed basic carburetor operation -		_____	_____
6. Located and identified basic parts of a horizontal float feed carburetor -		_____	_____
7. Removed from engine -		_____	_____
8. Drained fuel from fuel bowl -		_____	_____
9. Removed main mixture screw (if applicable) -		_____	_____
10. Removed fuel bowl and gasket -		_____	_____
11. Removed hinge pin -		_____	_____
12. Removed float -		_____	_____
13. Removed inlet needle and seat -		_____	_____
14. Removed main jet -		_____	_____
15. Removed low speed adjustment screw -		_____	_____
16. Cleaned all parts in solvent -		_____	_____
17. Inspected all parts for wear -		_____	_____

Duty: Servicing and Repairing Fuel Systems**Duty No.** I**Task No.** 3**Task:** Assemble a horizontal float feed carburetor, using appropriate equipment, to restore to operating condition.

Achievement Indicators:	The learner:	Yes	No
1. Followed personal safety rules -		_____	_____
2. Followed equipment safety rules -		_____	_____
3. Secured breakdown diagram of particular carburetor -		_____	_____
4. Installed low speed adjustment and set to manufacturer's specifications -		_____	_____
5. Installed main jet -		_____	_____
6. Installed inlet needle and seat - checked for free operation -		_____	_____
7. Installed and adjusted float and hinge pin -		_____	_____
8. Installed fuel bowl and gasket -		_____	_____
9. Installed main mixture screw - and pre-set to manufacturer's specifications -		_____	_____
10. Pressure-tested carburetor for leaks -		_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:**Resources:**

Duty: Servicing and Repairing Fuel Systems	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 2px;">Duty No.</td> <td style="width: 50%; padding: 2px;">I</td> </tr> <tr> <td style="padding: 2px;">Task No.</td> <td style="padding: 2px;">4</td> </tr> </table>	Duty No.	I	Task No.	4																																																		
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Duty: Servicing and Repairing Fuel Systems		Duty No. I																																																					
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Task: Assemble suction feed carburetor, using appropriate equipment, to restore to operating condition.																																																							
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Duty: Servicing and Repairing Fuel Systems		Duty No. 1																																																	
		Task No. 6																																																	
Task: Disassemble diaphragm carburetor using appropriate equipment, to inspect and identify parts.																																																			
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Reviewed basic carburetor operation -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Reviewed parts of diaphragm carburetor -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Removed from engine -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Secured breakdown diagram of particular carburetor -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Removed diaphragms and inspected for "curl" and stretching -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>8. Removed inlet needle and seat -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>9. Removed adjustment screws -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>10. Removed remaining parts as indicated by diagram -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>11. Cleaned in solvent -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Followed equipment safety rules -		_____	_____	3. Reviewed basic carburetor operation -		_____	_____	4. Reviewed parts of diaphragm carburetor -		_____	_____	5. Removed from engine -		_____	_____	6. Secured breakdown diagram of particular carburetor -		_____	_____	7. Removed diaphragms and inspected for "curl" and stretching -		_____	_____	8. Removed inlet needle and seat -		_____	_____	9. Removed adjustment screws -		_____	_____	10. Removed remaining parts as indicated by diagram -		_____	_____	11. Cleaned in solvent -		_____	_____
Achievement Indicators:	The learner:	Yes	No																																																
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																																																			
Tools and Equipment:	Resources:																																																		

Duty: Servicing and Repairing Fuel Systems		Duty No. I	
		Task No. 7	
Task: Assemble diaphragm carburetor, using appropriate equipment, to restore to operating condition.			
Achievement Indicators:	The learner:	Yes	No
1. Followed personal safety rules -		_____	_____
2. Followed equipment safety rules -		_____	_____
3. Installed adjustment screws - set to manufacturer's specifications for particular carburetor -		_____	_____
4. Installed inlet needle and seat -		_____	_____
5. Adjusted stroke of inlet needle as per specifications -		_____	_____
6. Installed diaphragms in reverse order of disassembly as per diagram -		_____	_____
7. Tested for proper operation -		_____	_____
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.			
Tools and Equipment:	Resources:		
	244		

Duty: Servicing and Repairing Fuel Systems		Duty No. I	
		Task No. 8	
Task: Rebuild carburetor, using appropriate equipment, to restore carburetor operation.			
Achievement indicators:	The learner:	Yes	No
1. Referred to manufacturer's repair manual for correct procedure to rebuild carburetor -		_____	_____
2. Removed carburetor from machine -		_____	_____
3. Drained carburetor of fuel -		_____	_____
4. Disassembled carburetor and placed in carburetor cleaner -		_____	_____
5. After cleaning, reassembled carburetor replacing worn parts -		_____	_____
6. Performed all carburetor adjustments/calibrations following manufacturer's procedures and specifications -		_____	_____
7. Reinstalled carburetor on engine -		_____	_____
8. Brought engine to operating temperatures and completed carburetor adjustments using a tachometer -		_____	_____
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.			
Tools and Equipment:	Resources:		
	245		

Duty: Servicing and Repairing Fuel Systems

Duty No. I

Task No. 9

Task: Clean carburetor air cleaner, using appropriate equipment, to restore air cleaner operation.

Achievement Indicators:	The learner:	Yes	No
1. Identified air cleaner system to be serviced -		_____	_____
2. Referred to manufacturer's repair manual for correct procedure for cleaning carburetor air cleaner -		_____	_____
3. Identified basic types of air cleaners -		_____	_____
4. Removed air cleaner cover -		_____	_____
5. Removed air cleaner element and inspected -		_____	_____
6. Reoiled air cleaner (foam type), if applicable -		_____	_____
7. Refilled air cleaner with proper oil (oil bath type), if applicable -		_____	_____
8. Replaced paper cartridge type (noncleanable), if applicable -		_____	_____
9. Cleaned air cleaner with clean shop rag -		_____	_____
10. Installed air cleaner element and cover -		_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing and Repairing Fuel Systems		Duty No. I																					
		Task No. 10																					
Task: Test fuel pump, using appropriate equipment, to detect deviations in pressure, volume or vacuum readings.																							
<table border="0"> <thead> <tr> <th>Achievement indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Identified fuel pump being serviced -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Referred to manufacturer's repair manual for correct procedure for testing fuel pump -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Tested fuel pump as required -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Replaced or repaired defective fuel pump as required -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement indicators:	The learner:	Yes	No	1. Identified fuel pump being serviced -		_____	_____	2. Referred to manufacturer's repair manual for correct procedure for testing fuel pump -		_____	_____	3. Tested fuel pump as required -		_____	_____	4. Replaced or repaired defective fuel pump as required -		_____	_____
Achievement indicators:	The learner:	Yes	No																				
1. Identified fuel pump being serviced -		_____	_____																				
2. Referred to manufacturer's repair manual for correct procedure for testing fuel pump -		_____	_____																				
3. Tested fuel pump as required -		_____	_____																				
4. Replaced or repaired defective fuel pump as required -		_____	_____																				
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																							
Tools and Equipment:	Resources:																						
	247																						

Duty: Servicing and Repairing Fuel Systems

Duty No. I

Task No. 11

Task: Adjust automatic choke, using appropriate equipment, to restore choke operation.

Achievement Indicators:	The learner:	Yes	No
1. Identified choke system being serviced -		_____	_____
2. Referred to manufacturer's repair manual for correct procedure to adjust automatic choke -		_____	_____
3. Adjusted choke to manufacturer's specifications -		_____	_____
4. Checked for proper operation -		_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing and Repairing Cooling Systems		Duty No. J																																	
		Task No. 1																																	
Task: Remove blower housing, using appropriate equipment, to inspect for proper operation.																																			
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Located engine model and serial numbers -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Removed blower housing -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Inspected mounting bolt flanges -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Inspected air deflectors -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Explained function and air flow pattern of blower housing -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Followed equipment safety rules -		_____	_____	3. Located engine model and serial numbers -		_____	_____	4. Removed blower housing -		_____	_____	5. Inspected mounting bolt flanges -		_____	_____	6. Inspected air deflectors -		_____	_____	7. Explained function and air flow pattern of blower housing -		_____	_____
Achievement Indicators:	The learner:	Yes	No																																
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Tools and Equipment:		Resources:																																	

Duty: Servicing and Repairing Cooling Systems		Duty No. J																																					
		Task No. 2																																					
Task: Service air cooling system, using appropriate equipment, to maintain operating condition.																																							
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Reviewed basic principles of the air cooling system -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Inspected blower housing for cracks and bends that may obstruct the flow of air -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Inspected flywheel fins for damage -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Inspected cooling fins on block for damage and obstructions -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Cleaned surfaces to maintain air flow -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>8. Cleaned grass screen -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Followed equipment safety rules -		_____	_____	3. Reviewed basic principles of the air cooling system -		_____	_____	4. Inspected blower housing for cracks and bends that may obstruct the flow of air -		_____	_____	5. Inspected flywheel fins for damage -		_____	_____	6. Inspected cooling fins on block for damage and obstructions -		_____	_____	7. Cleaned surfaces to maintain air flow -		_____	_____	8. Cleaned grass screen -		_____	_____
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Tools and Equipment:	Resources:																																						

Duty: Servicing and Repairing Starting Systems		Duty No. K																																					
		Task No. 1																																					
Task: Inspect recoil starter using appropriate equipment to determine wear and serviceability.																																							
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Identified basic styles of recoil systems -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Listed parts of recoil -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Disassembled recoil system -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Cleaned all parts -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Inspected spring -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>8. Reassembled unit -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Followed equipment safety rules -		_____	_____	3. Identified basic styles of recoil systems -		_____	_____	4. Listed parts of recoil -		_____	_____	5. Disassembled recoil system -		_____	_____	6. Cleaned all parts -		_____	_____	7. Inspected spring -		_____	_____	8. Reassembled unit -		_____	_____
Achievement Indicators:	The learner:	Yes	No																																				
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																																							
Tools and Equipment:	Resources:																																						

Teacher Activities	Student Learning Activities
1. Describe recoil starting systems. 2. Give handout on basic styles and explain each. 3. Demonstrate disassembly of recoil. 4. Show inspections to be made.	1. Listen to lecture on starting systems. 2. Obtain handout on basic styles. 3. Watch disassembly of recoil. 4. Disassemble unit, performing inspections. 5. Reassemble unit to operating condition. 253

Duty: Servicing and Repairing Starting Systems		Duty No. K																									
		Task No. 2																									
Task: Removed recoil assembly, using appropriate tools, to inspect for proper operation.																											
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Inspected for frayed rope -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Inspected starting dogs for wear -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Checked housing for cracks and bends -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Followed equipment safety rules -		_____	_____	3. Inspected for frayed rope -		_____	_____	4. Inspected starting dogs for wear -		_____	_____	5. Checked housing for cracks and bends -		_____	_____
Achievement Indicators:	The learner:	Yes	No																								
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Tools and Equipment:		Resources:																									

Duty: Servicing and Repairing Starting Systems		Duty No. K	
		Task No. 3	
Task: Install rope in recoil, using appropriate equipment, to restore operation.			
Achievement Indicators:	The Learner:	Yes	No
1. Followed personal safety rules -		_____	_____
2. Followed equipment safety rules -		_____	_____
3. Removed worn rope -		_____	_____
4. Selected correct diameter rope -		_____	_____
5. Located and followed procedure for rope installation as required -		_____	_____
6. Rewound spring tension -		_____	_____
7. Secured handle -		_____	_____
8. Tested for proper operation -		_____	_____
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.			
Tools and Equipment:	Resources:		

Duty: Servicing and Repairing Starting Systems		Duty No. K																																									
		Task No. 4																																									
Task: Replace recoil spring, using appropriate equipment, to restore operation.																																											
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Located part number using model and serial numbers -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Secured current replacement spring -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Removed broken spring -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Replaced with new spring -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Rewound tension on rope -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>8. Lubricated where required -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>9. Checked for proper operation -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Followed equipment safety rules -		_____	_____	3. Located part number using model and serial numbers -		_____	_____	4. Secured current replacement spring -		_____	_____	5. Removed broken spring -		_____	_____	6. Replaced with new spring -		_____	_____	7. Rewound tension on rope -		_____	_____	8. Lubricated where required -		_____	_____	9. Checked for proper operation -		_____	_____
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																																											
Tools and Equipment:	Resources:																																										

Duty: Servicing and Repairing Starting Systems

Duty No. K

Task No. 5

Task: Service Briggs and Stratton starter clutch, using appropriate equipment, to maintain operating condition.

Achievement indicators:

The learner:

Yes

No

1. Followed personal safety rules - _____
2. Followed equipment safety rules - _____
3. Removed starter clutch from engine - _____
4. Removed ratchet cover - _____
5. Removed starter ratchet - _____
6. Removed steel balls - _____
7. Cleaned entire assembly - _____
8. Inspected starter ratchet for wear - _____
9. Inspected seal in cover for wear and reoiled - _____
10. Reassembled unit - _____
11. Inspected crankshaft for knicks and burrs - _____
12. Checked operation - _____
13. Reassembled on engine - _____
14. Torqued to specification - _____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing and Repairing Starting Systems		Duty No. K																																																													
		Task No. 6																																																													
Task: Check operation of electric starters, using appropriate materials, to explain functions and parts.																																																															
<table border="0"> <thead> <tr> <th>Achievement indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td colspan="4">1. Identified the following starting units:</td> </tr> <tr> <td>a. 110 volt AC starter -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>b. 110 volt AC/DC starter -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>c. 12 volt starter and charging system -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>d. 12 volt bendix drive -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>e. 12 volt saf-t-key style -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>f. Nickel cadmium battery starter -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>g. Lead and battery starter system -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Followed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Followed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Located operational manual for particular style -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Identified testing procedure -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Followed testing procedure -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Located malfunctioning components -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement indicators:	The learner:	Yes	No	1. Identified the following starting units:				a. 110 volt AC starter -		_____	_____	b. 110 volt AC/DC starter -		_____	_____	c. 12 volt starter and charging system -		_____	_____	d. 12 volt bendix drive -		_____	_____	e. 12 volt saf-t-key style -		_____	_____	f. Nickel cadmium battery starter -		_____	_____	g. Lead and battery starter system -		_____	_____	2. Followed personal safety rules -		_____	_____	3. Followed equipment safety rules -		_____	_____	4. Located operational manual for particular style -		_____	_____	5. Identified testing procedure -		_____	_____	6. Followed testing procedure -		_____	_____	7. Located malfunctioning components -		_____	_____
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Tools and Equipment:		Resources:																																																													

Duty: Servicing and Repairing Starting Systems		Duty No. K																								
		Task No. 7																								
Task: Test starter control circuit, using appropriate equipment, to detect malfunctioning component.																										
<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; width: 60%;">Achievement Indicators:</th> <th style="text-align: left; width: 20%;">The learner:</th> <th style="text-align: center; width: 10%;">Yes</th> <th style="text-align: center; width: 10%;">No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>3. Referred to manufacturer's repair manual for correct procedure to test components -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>4. Secured equipment in a safe manner before testing -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> <tr> <td>5. Followed testing procedure to locate malfunctioning part -</td> <td></td> <td style="text-align: center;">_____</td> <td style="text-align: center;">_____</td> </tr> </tbody> </table>			Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Followed equipment safety rules -		_____	_____	3. Referred to manufacturer's repair manual for correct procedure to test components -		_____	_____	4. Secured equipment in a safe manner before testing -		_____	_____	5. Followed testing procedure to locate malfunctioning part -		_____	_____
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Tools and Equipment:	Resources:																									

Duty: Servicing and Repairing Starting Systems		Duty No. K																																									
		Task No. 8																																									
Task: Test starter current draw, using appropriate equipment, to detect current draw that exceeds specifications.																																											
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Referred to manufacturer's repair manual correct procedure to test starter current draw -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Referred to test equipment manufacturer's operating instructions to determine testing procedure -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Turned off all lights and accessories and closed all doors -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Connected tester leads to machine -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Disconnected ignition switch lead from ignition system to prevent starting -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Cranked engine while observing voltmeter and ammeter -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Compared readings with manufacturer's specifications -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>8. Performed voltage drop test if readings exceed specifications -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>9. Replaced or repaired any defective component -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Referred to manufacturer's repair manual correct procedure to test starter current draw -		_____	_____	2. Referred to test equipment manufacturer's operating instructions to determine testing procedure -		_____	_____	3. Turned off all lights and accessories and closed all doors -		_____	_____	4. Connected tester leads to machine -		_____	_____	5. Disconnected ignition switch lead from ignition system to prevent starting -		_____	_____	6. Cranked engine while observing voltmeter and ammeter -		_____	_____	7. Compared readings with manufacturer's specifications -		_____	_____	8. Performed voltage drop test if readings exceed specifications -		_____	_____	9. Replaced or repaired any defective component -		_____	_____
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																																											
Tools and Equipment:		Resources:																																									
		260																																									

Duty: Servicing and Repairing Starting Systems

Duty No. K

Task No. 9

Task: Replace starter solenoid, using appropriate equipment, to restore starter solenoid operation.

Achievement Indicators:

The learner:

Yes

No

1. Referred to manufacturer's repair manual for correct procedure for replacing starter solenoid - ☐ ☐
2. Disconnected negative (-) battery cable - ☐ ☐
3. Disconnected electrical leads from starter and solenoid - ☐ ☐
4. Removed starter assembly - ☐ ☐
5. Removed solenoid from starter - ☐ ☐
6. Installed replacement solenoid - ☐ ☐
7. Installed starter assembly - ☐ ☐
8. Connected electrical leads to starter and solenoid - ☐ ☐
9. Connected negative (-) battery cable - ☐ ☐
10. Started engine to check operation - ☐ ☐

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing and Repairing Starting Systems		Duty No. K	
		Task No. 10	
Task: Replace starter, using appropriate equipment, to restore starter operation.			
Achievement Indicators:	The learner:	Yes	No
1. Referred to manufacturer's repair manual for correct procedure to replace starter -		_____	_____
2. Disconnected negative (-) battery cable -		_____	_____
3. Removed electrical connections from starter -		_____	_____
4. Removed starter and shims if present -		_____	_____
5. Inspected flywheel ring gear for damage -		_____	_____
6. Installed new starter and shims if present -		_____	_____
7. Connected electrical connections to starter -		_____	_____
8. Connected negative (-) battery cable -		_____	_____
9. Tested operation of replacement starter -		_____	_____
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.			
Tools and Equipment:	Resources:		
	262		

Duty: Servicing and Repairing Two-Cycle Engines		Duty No. L Task No. 1																																					
Task: Disassemble two-cycle engines, using appropriate tools, to inspect for wear and serviceability.																																							
<table border="0"> <tr> <td>Achievement Indicators:</td> <td>The learner:</td> <td>Yes</td> <td>No</td> </tr> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Identified engine being serviced -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Located model and serial numbers -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Disassembled entire engine -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Inspected needle bearings (where applicable) -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Inspected cylinder for wear -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>8. Laid out all parts for final inspection by instructor -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Followed equipment safety rules -		_____	_____	3. Identified engine being serviced -		_____	_____	4. Located model and serial numbers -		_____	_____	5. Disassembled entire engine -		_____	_____	6. Inspected needle bearings (where applicable) -		_____	_____	7. Inspected cylinder for wear -		_____	_____	8. Laid out all parts for final inspection by instructor -		_____	_____
Achievement Indicators:	The learner:	Yes	No																																				
1. Followed personal safety rules -		_____	_____																																				
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Teacher Activities	Student Learning Activities
1. Provide disassembly instruction sheet. 2. Provide two-cycle engine.	1. Obtain instruction sheet. 2. Disassemble two-cycle engine. 3. Have inspected. 4. Reassemble to running condition. 264

Duty: Servicing and Repairing Two-Cycle Engines

Duty No. L

Task No. 2

Task: Inspect reed valve, using appropriate materials, to check for proper operation.

Achievement Indicators:

The learner:

Yes

No

1. Followed personal safety rules -
2. Followed equipment safety rules -
3. Checked individual reeds for breakage -
4. Checked individual reeds for warpage -
5. Lapped reed plate (where applicable) -

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing and Repairing Two-Cycle Engines

Duty No. L

Task No. 3

Task: Inspect rotary valve, using appropriate materials, to check for proper operation.

Achievement Indicators:

The learner:

Yes

No

1. Followed personal safety rules -
2. Followed equipment safety rules -
3. Checked plate locator for wear -
4. Checked plate for warpage -
5. Checked thickness for wear -
6. Inspected timing sequence -

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing and Repairing Two-Cycle Engines		Duty No. L																																																	
		Task No. 4																																																	
Task: Reassemble two-cycle engine, using appropriate equipment, to return engine to operating condition.																																																			
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>3. Reviewed reassembly procedure -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>4. Oiled all moving parts -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>5. Installed parts in reverse order of disassembly -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>6. Tightened all bolts to appropriate torque -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>7. Wiped engine of all oil and finger prints -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>8. Mounted on test stand -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>9. Filled with fresh fuel -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>10. Performed safety inspection -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>11. Started engine, adjusted as required -</td> <td></td> <td>☐</td> <td>☐</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		☐	☐	2. Followed equipment safety rules -		☐	☐	3. Reviewed reassembly procedure -		☐	☐	4. Oiled all moving parts -		☐	☐	5. Installed parts in reverse order of disassembly -		☐	☐	6. Tightened all bolts to appropriate torque -		☐	☐	7. Wiped engine of all oil and finger prints -		☐	☐	8. Mounted on test stand -		☐	☐	9. Filled with fresh fuel -		☐	☐	10. Performed safety inspection -		☐	☐	11. Started engine, adjusted as required -		☐	☐
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Tools and Equipment:	Resources:																																																		

Duty: Servicing and Repairing Two-Cycle Engines		Duty No. L												
		Task No. 5												
Task: Mix fuel supply, using appropriate equipment, to prepare engine for operation.														
Achievement Indicators:	The Learner:	<table border="1"> <thead> <tr> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </tbody> </table>	Yes	No	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Yes	No													
_____	_____													
_____	_____													
_____	_____													
_____	_____													
_____	_____													
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.														
Tools and Equipment:	Resources:													

Duty: Servicing and Repairing Two-Cycle Engines		Duty No. L	
		Task No. 6	
Task: Pressure test engine crankcase, using appropriate materials, to determine leakage.			
Achievement Indicators:	The learner:	Yes	No
1. Followed personal safety rules -		_____	_____
2. Followed equipment safety rules -		_____	_____
3. Reviewed operation of crankcase seals -		_____	_____
4. Applied appropriate pressure/vacuum using testing device -		_____	_____
5. Compared leakage to manufacturer's specifications -		_____	_____
6. Replaced defective seals -		_____	_____
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.			
Tools and Equipment:	Resources:		

Duty: Servicing General Equipment		Duty No. M	
		Task No. 1	
Task: Service auxiliary drive units, using appropriate equipment, to maintain operating condition.			
Achievement Indicators:	The learner:	Yes	No
1. Followed personal safety rules -		_____	_____
2. Followed equipment safety rules -		_____	_____
3. Reviewed operation of drive systems -		_____	_____
4. Checked belt tension and condition -		_____	_____
5. Checked chain tension -		_____	_____
6. Cleaned and lubricated chain -		_____	_____
7. Inspected drive disc and friction wheel for wear -		_____	_____
8. Inspected cog drive wheel -		_____	_____
9. Adjusted cog alignment -		_____	_____
10. Lubricated as required -		_____	_____
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.			
Tools and Equipment:	Resources:		
	270		

Teacher Activities	Student Learning Activities
1. Provide handout on drive systems. 2. Demonstrate service procedures.	1. Obtain handout on drive system. 2. Service the following: a. belt drive b. chain drive c. friction drive d. cog drive 3. Have each checked by instructor. 271

Duty: Servicing General Equipment		Duty No. M																																				
		Task No. 2																																				
Task: Service differential, using appropriate equipment, to maintain operating condition.																																						
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Cleaned area to be serviced -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Inspected differential for exterior damage -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Drained and inspected oil -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Refilled to appropriate level -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Inspected for oil leaks and damaged seals -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>8. Checked operation -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>			Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Followed equipment safety rules -		_____	_____	3. Cleaned area to be serviced -		_____	_____	4. Inspected differential for exterior damage -		_____	_____	5. Drained and inspected oil -		_____	_____	6. Refilled to appropriate level -		_____	_____	7. Inspected for oil leaks and damaged seals -		_____	_____	8. Checked operation -		_____	_____
Achievement Indicators:	The learner:	Yes	No																																			
1. Followed personal safety rules -		_____	_____																																			
2. Followed equipment safety rules -		_____	_____																																			
3. Cleaned area to be serviced -		_____	_____																																			
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7. Inspected for oil leaks and damaged seals -		_____	_____																																			
8. Checked operation -		_____	_____																																			
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																																						
Tools and Equipment:		Resources:																																				

272

Duty: Servicing General Equipment

Duty No. M

Task No. 3

Task: Service lawnmower blade, using appropriate equipment, to maintain operating condition.

Achievement Indicators:

The learner:

Yes

No

- | | | |
|--|-------|-------|
| 1. Followed personal safety rules - | _____ | _____ |
| 2. Followed equipment safety rules - | _____ | _____ |
| 3. Removed spark plug wire and grounded - | _____ | _____ |
| 4. Inspected blade adaptor for damage - | _____ | _____ |
| 5. Removed blade - | _____ | _____ |
| 6. Inspected for damaged cutting surface - | _____ | _____ |
| 7. Inspected for damaged lift area of blade - | _____ | _____ |
| 8. Inspected mounting hole for damage - | _____ | _____ |
| 9. Inspected blade for cracks and bend - | _____ | _____ |
| 10. Sharpened cutting surface of blade with file or grinder (30 degrees) - | _____ | _____ |
| 11. Balanced blade, resharpened if necessary - | _____ | _____ |
| 12. Installed blade in correct direction - | _____ | _____ |
| 13. Performed safety inspection - | _____ | _____ |

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing General Equipment		Duty No. M Task No. 4																																													
Task: Service rotary mower body, using appropriate equipment, to maintain operating condition.																																															
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Removed blade -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Serviced blade -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Scraped grass from mower deck bottom -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Removed and serviced wheels -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Cleaned outer body -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>8. Checked operation of grass deflector -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>9. Checked operation of stone deflector -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>10. Reassembled unit -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Followed equipment safety rules -		_____	_____	3. Removed blade -		_____	_____	4. Serviced blade -		_____	_____	5. Scraped grass from mower deck bottom -		_____	_____	6. Removed and serviced wheels -		_____	_____	7. Cleaned outer body -		_____	_____	8. Checked operation of grass deflector -		_____	_____	9. Checked operation of stone deflector -		_____	_____	10. Reassembled unit -		_____	_____
Achievement Indicators:	The learner:	Yes	No																																												
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																																															
Tools and Equipment:	Resources:																																														

Duty: Servicing General Equipment

Duty No. M

Task No. 5

Task: Adjust throttle control, using appropriate equipment, to maintain operating condition.

Achievement Indicators:

The learner:

Yes

No

1. Followed personal safety rules -
2. Followed equipment safety rules -
3. Loosened cable clamp at engine -
4. Moved engine throttle to the stop position -
5. Moved throttle control to stop position -
6. Tightened cable clamp on engine -
7. Checked position at full throttle, readjusted if necessary -
8. Oiled all friction points -

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing General Equipment		Duty No. M																																									
		Task No. 6																																									
Task: Service riding mower front axle, using appropriate equipment, to maintain operating condition.																																											
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>3. Cleaned area to be serviced -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>4. Inspected steering knuckles -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>5. Inspected wheel bearings or bushings -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>6. Repacked front wheel bearings -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>7. Cleaned grease fittings, greased as required -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>8. Checked pressure of front tires -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>9. Checked steering travel and free play -</td> <td></td> <td>☐</td> <td>☐</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		☐	☐	2. Followed equipment safety rules -		☐	☐	3. Cleaned area to be serviced -		☐	☐	4. Inspected steering knuckles -		☐	☐	5. Inspected wheel bearings or bushings -		☐	☐	6. Repacked front wheel bearings -		☐	☐	7. Cleaned grease fittings, greased as required -		☐	☐	8. Checked pressure of front tires -		☐	☐	9. Checked steering travel and free play -		☐	☐
Achievement Indicators:	The learner:	Yes	No																																								
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																																											
Tools and Equipment:		Resources:																																									

Duty: Servicing General Equipment

Duty No. 4

Task No. 7

Task: Adjust band axle brakes, using appropriate equipment, to maintain operating condition.

Achievement Indicators:

The learner:

Yes

No

1. Followed personal safety rules -
2. Followed equipment safety rules -
3. Cleaned area to be serviced -
4. Reviewed adjustment procedure -
5. Inspected condition of bands -
6. Determined "free play" -
7. Adjusted "free play" to manufacturer's specifications -
8. Adjusted pedal linkage -
9. Tested brakes for operation -

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing General Equipment		Duty No. 4																																	
		Task No. 8																																	
Task: Adjust clutch linkage, using appropriate equipment, to maintain operating condition.																																			
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>3. Cleaned area to be serviced -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>4. Reviewed clutch adjustment procedure -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>5. Determined clutch adjustment -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>6. Adjusted clutch and linkage -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>7. Tested operation of clutch -</td> <td></td> <td>☐</td> <td>☐</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		☐	☐	2. Followed equipment safety rules -		☐	☐	3. Cleaned area to be serviced -		☐	☐	4. Reviewed clutch adjustment procedure -		☐	☐	5. Determined clutch adjustment -		☐	☐	6. Adjusted clutch and linkage -		☐	☐	7. Tested operation of clutch -		☐	☐
Achievement Indicators:	The learner:	Yes	No																																
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																																			
Tools and Equipment:		Resources:																																	

Duty: Servicing General Equipment**Duty No.** M**Task No.** 9**Task:** Service roto-tiller tines, using appropriate equipment, to maintain operating condition.**Achievement Indicators:**

The learner:

Yes

No

1. Followed personal safety rules -
2. Followed equipment safety rules -
3. Reviewed service procedures -
4. Removed tines -
5. Cleaned tines and shafts -
6. Inspected tines for damage -
7. Restored cutting edge of tines -
8. Measured tip width for reject size -
9. Inspected gear box for leaks and damaged seals -
10. Reassembled tines on shafts -

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Criteria:

Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:**Resources:**

Duty: Servicing General Equipment		Duty No. M																																									
		Task No. 10																																									
Task: Service roto-tiller gear box using appropriate equipment, to maintain operating condition.																																											
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Cleaned area to be serviced -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Removed tines -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Drained gear box of oil -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Refilled to proper level with appropriate oil -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Inspected gear case for damage, leaks and seal cracks -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>8. Reassembled unit -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>9. Checked operation -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Followed equipment safety rules -		_____	_____	3. Cleaned area to be serviced -		_____	_____	4. Removed tines -		_____	_____	5. Drained gear box of oil -		_____	_____	6. Refilled to proper level with appropriate oil -		_____	_____	7. Inspected gear case for damage, leaks and seal cracks -		_____	_____	8. Reassembled unit -		_____	_____	9. Checked operation -		_____	_____
Achievement Indicators:	The learner:	Yes	No																																								
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																																											
Tools and Equipment:	Resources:																																										

Duty: Servicing General Equipment

Duty No. -M

Task No. 11

Task: Service gas powered lawn edger, using appropriate equipment, to maintain operating condition.

Achievement Indicators:

The learner:

Yes

No

1. Followed personal safety rules -
2. Followed equipment safety rules -
3. Serviced engine as appropriate task sheet -
4. Inspected and adjusted belt drive unit -
5. Removed and inspected cutting blade -
6. Scraped grass and dirt from housing -
7. Inspected arbor bearing for wear -
8. Replaced cutting blade -
9. Reassembled unit -
10. Tested unit for proper operation -

_____	_____
_____	_____
_____	_____
_____	_____
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_____	_____
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_____	_____
_____	_____
_____	_____

Criteria:

Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing General Equipment		Duty No. M																																					
		Task No. 12																																					
Task: Remove chain saw, using appropriate equipment, to inspect chain.																																							
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>3. Loosened bar nuts -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>4. Removed chain covers -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>5. Removed chain -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>6. Inspected drive links -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>7. Inspected chisel teeth -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>8. Tested for excessive stretching -</td> <td></td> <td>☐</td> <td>☐</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		☐	☐	2. Followed equipment safety rules -		☐	☐	3. Loosened bar nuts -		☐	☐	4. Removed chain covers -		☐	☐	5. Removed chain -		☐	☐	6. Inspected drive links -		☐	☐	7. Inspected chisel teeth -		☐	☐	8. Tested for excessive stretching -		☐	☐
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Duty: Servicing General Equipment		Duty No. M																																	
		Task No. 13																																	
Task: Adjust chain saw tension, using appropriate tools, to maintain and increase chain life.																																			
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Duty: Servicing General Equipment		Duty No. M																																	
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Task: Inspect chain saw bar, using appropriate materials, to locate possible damage and wear.																																			
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Duty: Servicing General Equipment		Duty No. M																																																									
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Task: Service chain saw clutch, using appropriate equipment, to maintain operating condition.																																																											
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Duty: Servicing General Equipment		Duty No. H																																	
		Task No. 16																																	
Task: Sharpen chain saw, using appropriate equipment, to restore cutting condition.																																			
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Task: Service snowmobile track, using appropriate equipment, to maintain operating condition.																															
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Duty: Servicing General Equipment		Duty No. M
		Task No. 18
Task: Service torque convertor of snowmobile, using appropriate equipment, to maintain operating condition.		
Achievement Indicators:	The learner:	Yes No
1. Followed personal safety rules -		_____
2. Followed equipment safety rules -		_____
3. Reviewed operation of belt driven convertor -		_____
4. Removed safety guards -		_____
5. Removed belt -		_____
6. Removed clutch assembly -		_____
7. Inspected springs, pivot pins and all bearing surfaces -		_____
8. Lubricated all friction points -		_____
9. Reassembled unit -		_____
10. Checked operation -		_____
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.		
Tools and Equipment:	Resources:	

Duty: Servicing General Equipment		Duty No. M																																					
		Task No. 19																																					
Task: Service snowmobile skis, using appropriate equipment, to maintain operating condition.																																							
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Duty: Servicing General Equipment		Duty No. M										
		Task No. 20										
Task: Review designs of snow throwers, using appropriate equipment, to identify and explain functions.												
Achievement Indicators:	The learner:	<table border="1"> <thead> <tr> <th>Yes</th><th>No</th></tr> </thead> <tbody> <tr> <td>_____</td><td>_____</td></tr> <tr> <td>_____</td><td>_____</td></tr> <tr> <td>_____</td><td>_____</td></tr> <tr> <td>_____</td><td>_____</td></tr> </tbody> </table>	Yes	No	_____	_____	_____	_____	_____	_____	_____	_____
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Duty: Servicing General Equipment		Duty No. M																																																													
		Task No. 21																																																													
Task: Service snow thrower, using appropriate equipment, to maintain operating condition.																																																															
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr><td>1. Followed personal safety rules -</td><td></td><td>_____</td><td>_____</td></tr> <tr><td>2. Followed equipment safety rules -</td><td></td><td>_____</td><td>_____</td></tr> <tr><td>3. Serviced engine as per appropriate task -</td><td></td><td>_____</td><td>_____</td></tr> <tr><td>4. Removed belt and chain covers -</td><td></td><td>_____</td><td>_____</td></tr> <tr><td>5. Inspected belts and chains for wear and adjustments -</td><td></td><td>_____</td><td>_____</td></tr> <tr><td>6. Adjusted throttle linkage -</td><td></td><td>_____</td><td>_____</td></tr> <tr><td>7. Adjusted drive clutch linkage -</td><td></td><td>_____</td><td>_____</td></tr> <tr><td>8. Adjusted auger clutch linkage -</td><td></td><td>_____</td><td>_____</td></tr> <tr><td>9. Adjusted front skid bars and scraper -</td><td></td><td>_____</td><td>_____</td></tr> <tr><td>10. Adjusted discharge chute -</td><td></td><td>_____</td><td>_____</td></tr> <tr><td>11. Lubricated auger and chute surfaces -</td><td></td><td>_____</td><td>_____</td></tr> <tr><td>12. Lubricated all friction points -</td><td></td><td>_____</td><td>_____</td></tr> <tr><td>13. Inspected and adjusted tire chains -</td><td></td><td>_____</td><td>_____</td></tr> <tr><td>14. Performed final safety check -</td><td></td><td>_____</td><td>_____</td></tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Followed equipment safety rules -		_____	_____	3. Serviced engine as per appropriate task -		_____	_____	4. Removed belt and chain covers -		_____	_____	5. Inspected belts and chains for wear and adjustments -		_____	_____	6. Adjusted throttle linkage -		_____	_____	7. Adjusted drive clutch linkage -		_____	_____	8. Adjusted auger clutch linkage -		_____	_____	9. Adjusted front skid bars and scraper -		_____	_____	10. Adjusted discharge chute -		_____	_____	11. Lubricated auger and chute surfaces -		_____	_____	12. Lubricated all friction points -		_____	_____	13. Inspected and adjusted tire chains -		_____	_____	14. Performed final safety check -		_____	_____
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Tools and Equipment:	Resources:																																																														

Duty: Servicing General Equipment		Duty No. M																																																													
		Task No. 22																																																													
Task: Repack wheel bearings, using appropriate equipment, to maintain operating condition.																																																															
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Removed bearing cover -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Removed cotter pin and safety cap -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Removed bearing nut -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Removed bearing -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Cleaned bearing in appropriate solvent -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>8. Dried bearing (soft cloth - no air) -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>9. Inspected bearing for damage -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>10. Repacked bearing with appropriate grease -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>11. Reassembled unit -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>12. Tightened nut to manufacturer's specifications -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>13. Installed remaining parts -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>14. Tested operation -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Followed equipment safety rules -		_____	_____	3. Removed bearing cover -		_____	_____	4. Removed cotter pin and safety cap -		_____	_____	5. Removed bearing nut -		_____	_____	6. Removed bearing -		_____	_____	7. Cleaned bearing in appropriate solvent -		_____	_____	8. Dried bearing (soft cloth - no air) -		_____	_____	9. Inspected bearing for damage -		_____	_____	10. Repacked bearing with appropriate grease -		_____	_____	11. Reassembled unit -		_____	_____	12. Tightened nut to manufacturer's specifications -		_____	_____	13. Installed remaining parts -		_____	_____	14. Tested operation -		_____	_____
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Tools and Equipment:		Resources:																																																													

Duty: Servicing General Equipment	Duty No. M
	Task No. 23

Task: Jump start a machine with a dead battery, using appropriate equipment, to return the machine to operating condition.

Achievement Indicators:	The learner:	Yes	No
1. Placed running machine near front of disabled machine -		_____	_____
2. Exposed both batteries -		_____	_____
3. Located positive and negative battery terminals on both machines -		_____	_____
4. Determined the polarity of each terminal before making the jumper connections -		_____	_____
5. Connected one end of the red jumper cable to positive (+) battery terminal on the disabled machine -		_____	_____
6. Connected one end of the green jumper cable to a good ground on the engine block or the negative (-) battery terminal of the disabled vehicle -		_____	_____
7. Connected the remaining end of the red jumper cable to the positive (+) battery terminal of the good machine -		_____	_____
8. Started and allowed the good machine to run -		_____	_____
9. Connected the remaining end of green cable to good ground on the engine block away from the battery -		_____	_____
10. Allowed machine to remain in this configuration for a few minutes to help charge the dead battery -		_____	_____
11. Started machine with dead battery -		_____	_____
12. Removed jumper cables starting with one of the green or negative (-) cables first -		_____	_____
13. Removed cables from the other three connections -		_____	_____

Duty: Servicing General Equipment		Duty No. M																						
		Task No. 24																						
Task: Service weed eater, using appropriate equipment, to maintain operating condition.																								
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Serviced engine as per appropriate task -</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Inspected line/spool mechanism -</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Adjusted auto line feed control -</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Removed and replaced trim line -</td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	Yes	No	1. Followed personal safety rules -	_____	_____	2. Followed equipment safety rules -	_____	_____	3. Serviced engine as per appropriate task -	_____	_____	4. Inspected line/spool mechanism -	_____	_____	5. Adjusted auto line feed control -	_____	_____	6. Removed and replaced trim line -	_____	_____
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Tools and Equipment:	Resources:																							

Duty: Servicing General Equipment		Duty No. M																																								
		Task No. 25																																								
Task: Service micro-safety switches, using appropriate equipment, to maintain operating condition.																																										
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Identified type of safety switches used -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Secured diagram locating switches -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Followed diagram to locate switches -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Tested operation of each switch in circuit -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Adjusted switch location -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>8. Inspected wires and connectors -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>9. Tested operation of circuit by running engine -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>			Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Followed equipment safety rules -		_____	_____	3. Identified type of safety switches used -		_____	_____	4. Secured diagram locating switches -		_____	_____	5. Followed diagram to locate switches -		_____	_____	6. Tested operation of each switch in circuit -		_____	_____	7. Adjusted switch location -		_____	_____	8. Inspected wires and connectors -		_____	_____	9. Tested operation of circuit by running engine -		_____	_____
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Tools and Equipment:	Resources:																																									

Duty: Servicing General Equipment		Duty No. M																													
		Task No. 26																													
Task: Service blade brake mechanisms, using appropriate equipment, to test for safe operating condition.																															
<table border="0"> <tr> <td>Achievement Indicators:</td> <td>The learner:</td> <td>Yes</td> <td>No</td> </tr> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Identified unit being serviced</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Located manufacturer's test procedure and data -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Tested unit as required -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Repaired as necessary -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Followed equipment safety rules -		_____	_____	3. Identified unit being serviced		_____	_____	4. Located manufacturer's test procedure and data -		_____	_____	5. Tested unit as required -		_____	_____	6. Repaired as necessary -		_____	_____
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Tools and Equipment:	Resources:																														

Duty: Practicing Measurement		Duty No. N																					
		Task No. 1																					
Task: Demonstrate measuring skills, using a standard 12" ruler, to determine size to the nearest 1/16 of an inch.																							
<table border="0"> <tr> <td>Achievement Indicators:</td> <td>The learner:</td> <td>Yes</td> <td>No</td> </tr> <tr> <td>1. Selected appropriate size ruler -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Measured five objects to the nearest 1/16 of an inch -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Reduced all fractions to the lowest common denominator -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Listed readings -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </table>				Achievement Indicators:	The learner:	Yes	No	1. Selected appropriate size ruler -		_____	_____	2. Measured five objects to the nearest 1/16 of an inch -		_____	_____	3. Reduced all fractions to the lowest common denominator -		_____	_____	4. Listed readings -		_____	_____
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																							
Tools and Equipment:		Resources:																					

Teacher Activities	Student Learning Activities
1. Demonstrate use of rule and value of graduations. 2. Give handout on practicing measurement.	1. Watch demonstration on rule. 2. Fill in worksheet and rulers. 3. Practice on several objects.

Duty: Practicing Measurement		Duty No. N																																					
		Task No. 2																																					
Task: Demonstrate measuring skills, using an outside micrometer, to measure outside dimensions within .001.																																							
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Reviewed care and storage procedures -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Reviewed operation of outside micrometers -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Selected appropriate size outside micrometer for work-piece being measured -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Performed visual inspection of outside micrometer removing dirt and metal shavings -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Checked micrometer at zero reference -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Cleaned workpiece of dirt and abrasives -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Measured at least three workpieces -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>8. Listed readings -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Reviewed care and storage procedures -		_____	_____	2. Reviewed operation of outside micrometers -		_____	_____	3. Selected appropriate size outside micrometer for work-piece being measured -		_____	_____	4. Performed visual inspection of outside micrometer removing dirt and metal shavings -		_____	_____	5. Checked micrometer at zero reference -		_____	_____	6. Cleaned workpiece of dirt and abrasives -		_____	_____	7. Measured at least three workpieces -		_____	_____	8. Listed readings -		_____	_____
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Tools and Equipment:	Resources:																																						

Duty: Practicing Measurement		Duty No. N																																					
		Task No. 3																																					
Task: Demonstrate measuring skills, using Vernier Calipers, to measure several selected pieces of metal to within .001 of an inch.																																							
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Reviewed care and storage procedures -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Selected workpieces to be measured -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Cleaned workpiece free of dirt and abrasives -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Checked Vernier Calipers at zero reference -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Used outside measuring gauge to measure workpiece -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Used depth measuring gauge to measure workpiece -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Used inside measuring gauge to measure workpiece -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>8. Listed readings -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Reviewed care and storage procedures -		_____	_____	2. Selected workpieces to be measured -		_____	_____	3. Cleaned workpiece free of dirt and abrasives -		_____	_____	4. Checked Vernier Calipers at zero reference -		_____	_____	5. Used outside measuring gauge to measure workpiece -		_____	_____	6. Used depth measuring gauge to measure workpiece -		_____	_____	7. Used inside measuring gauge to measure workpiece -		_____	_____	8. Listed readings -		_____	_____
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Tools and Equipment:	Resources:																																						

Duty: Practicing Measurement		Duty No. N																																	
		Task No. 4																																	
Task: Demonstrate measuring skills, using telescope gauges, to measure bore of a cylinder within .001 of an inch.																																			
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Reviewed care and storage procedures -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Selected workpieces to be measured -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Selected proper size telescope gauge -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Cleaned cylinder of dirt, oil, and abrasives -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Preadjusted telescope gauges -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Measured workpiece -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Listed readings -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Reviewed care and storage procedures -		_____	_____	2. Selected workpieces to be measured -		_____	_____	3. Selected proper size telescope gauge -		_____	_____	4. Cleaned cylinder of dirt, oil, and abrasives -		_____	_____	5. Preadjusted telescope gauges -		_____	_____	6. Measured workpiece -		_____	_____	7. Listed readings -		_____	_____
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																																			
Tools and Equipment:	Resources:																																		

Duty: Practicing Measurement**Duty No.** N**Task No.** 5**Task:** Demonstrate measuring skills, using a depth micrometer, to measure the depth of a recessed surface to within .001.**Achievement Indicators:**

The learner:

Yes

No

1. Reviewed care and storage procedures -
2. Selected workpieces to be measured -
3. Selected proper length depth micrometer shaft -
4. Cleaned workpiece of dirt and abrasives -
5. Checked zero reference on micrometer -
6. Measured workpieces -
7. Listed readings -

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.**Tools and Equipment:****Resources:**

Duty: Practicing Measurement		Duty No. N																													
		Task No. 6																													
Task: Demonstrate measuring skills, using a dial indicator, to measure piston travel.																															
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Reviewed care and storage procedures -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Reviewed operation of dial indicator -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Secured dial indicator in spark plug hole over piston -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Adjusted for top dead center -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Measured piston travel -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Recorded readings -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Reviewed care and storage procedures -		_____	_____	2. Reviewed operation of dial indicator -		_____	_____	3. Secured dial indicator in spark plug hole over piston -		_____	_____	4. Adjusted for top dead center -		_____	_____	5. Measured piston travel -		_____	_____	6. Recorded readings -		_____	_____
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6. Recorded readings -		_____	_____																												
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Tools and Equipment:		Resources:																													

Duty: Practicing Measurement		Duty No. N																					
		Task No. 7																					
Task: Demonstrate measuring skills, using a dial indicator, to measure "run out" of a centered object.																							
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Reviewed care and storage procedures -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Reviewed operation of dial indicator -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Selected workpiece to be measured -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Measured and recorded readings -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Reviewed care and storage procedures -		_____	_____	2. Reviewed operation of dial indicator -		_____	_____	3. Selected workpiece to be measured -		_____	_____	4. Measured and recorded readings -		_____	_____
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Tools and Equipment:	Resources:																						

Duty: Practicing Measurement		Duty No. N																					
		Task No. 8																					
Task: Demonstrate measuring skills, using a bore gauge, to measure the bore of a cylinder.																							
<table border="0"> <tr> <td>Achievement Indicators:</td> <td>The learner:</td> <td>Yes</td> <td>No</td> </tr> <tr> <td>1. Reviewed care and storage procedures -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Reviewed operation of bore gauge -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Selected work piece to be measured -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Measured and recorded readings -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </table>				Achievement Indicators:	The learner:	Yes	No	1. Reviewed care and storage procedures -		_____	_____	2. Reviewed operation of bore gauge -		_____	_____	3. Selected work piece to be measured -		_____	_____	4. Measured and recorded readings -		_____	_____
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Tools and Equipment:		Resources:																					

Duty: Servicing and Repairing Motorcycles		Duty No. 0																														
		Task No. 1																														
Task: Service "wet clutch", using appropriate equipment, to maintain operating condition.																																
Achievement Indicators:	The learner:	<table border="1"> <thead> <tr> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr><td>_____</td><td>_____</td></tr> <tr><td>_____</td><td>_____</td></tr> <tr><td>_____</td><td>_____</td></tr> <tr><td>_____</td><td>_____</td></tr> <tr><td>_____</td><td>_____</td></tr> <tr><td>_____</td><td>_____</td></tr> <tr><td>_____</td><td>_____</td></tr> <tr><td>_____</td><td>_____</td></tr> <tr><td>_____</td><td>_____</td></tr> <tr><td>_____</td><td>_____</td></tr> <tr><td>_____</td><td>_____</td></tr> <tr><td>_____</td><td>_____</td></tr> <tr><td>_____</td><td>_____</td></tr> <tr><td>_____</td><td>_____</td></tr> </tbody> </table>	Yes	No	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
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Tools and Equipment:	Resources:																															

Teacher Activities	Student Learning Activities
1. Give handout on "wet clutches." 2. Demonstrate disassembly of wet clutch. 3. Demonstrate inspection procedures.	1. Obtain handout on "wet clutches." 2. Watch demonstration on "wet clutches." 3. Disassemble and inspect "wet clutch" unit. 4. Reassemble "wet clutch" unit.

Duty: Servicing and Repairing Motorcycles		Duty No. 0																																										
		Task No. 2																																										
Task: Service front suspension, using appropriate equipment, to maintain operating condition.																																												
Achievement Indicators:	The learner:	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;"></th> <th style="width: 20%; text-align: center;">Yes</th> <th style="width: 20%; text-align: center;">No</th> </tr> </thead> <tbody> <tr><td>1. Followed personal safety rules -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>2. Followed equipment safety rules -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>3. Reviewed procedure for disassembly for particular model -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>4. Removed front wheel -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>5. Removed top fork clamps -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>6. Removed top bolt and spring -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>7. Drained fork oil -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>8. Separated inner and outer tubes -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>9. Removed oil seals -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>10. Replaced oil seals as required -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>11. Inspected all parts for wear and replaced if necessary -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>12. Reassembled unit -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>13. Tested for proper operation -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> </tbody> </table>		Yes	No	1. Followed personal safety rules -	_____	_____	2. Followed equipment safety rules -	_____	_____	3. Reviewed procedure for disassembly for particular model -	_____	_____	4. Removed front wheel -	_____	_____	5. Removed top fork clamps -	_____	_____	6. Removed top bolt and spring -	_____	_____	7. Drained fork oil -	_____	_____	8. Separated inner and outer tubes -	_____	_____	9. Removed oil seals -	_____	_____	10. Replaced oil seals as required -	_____	_____	11. Inspected all parts for wear and replaced if necessary -	_____	_____	12. Reassembled unit -	_____	_____	13. Tested for proper operation -	_____	_____
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																																												
Tools and Equipment:	Resources:																																											

Duty: Servicing and Repairing Motorcycles**Duty No.** 0**Task No.** 3**Task:** Service chain, using appropriate equipment, to maintain operating condition.**Achievement Indicators:****The learner:****Yes****No**

- | | | |
|--|-------|-------|
| 1. Followed personal safety rules - | _____ | _____ |
| 2. Followed equipment safety rules - | _____ | _____ |
| 3. Removed master link and chain - | _____ | _____ |
| 4. Cleaned in appropriate solvent - | _____ | _____ |
| 5. Checked "stretch" of chain - should not exceed 2% or
1/4 inch per foot - | _____ | _____ |
| 6. Inspected links for damage - | _____ | _____ |
| 7. Inspected sprocket pitch for wear - front and rear - | _____ | _____ |
| 8. Lubricated chain with appropriate material - | _____ | _____ |
| 9. Installed chain - | _____ | _____ |
| 10. Adjusted chain tension as per manufacturer's specifi-
cation - | _____ | _____ |
| 11. Checked alignment of rear wheel - | _____ | _____ |
| 12. Checked for smooth operation of chain - | _____ | _____ |

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:**Resources:**

Duty: Servicing and Repairing Motorcycles

Duty No. 0

Task No. 4

Task: Service tire, using appropriate equipment, to maintain operating condition.

Achievement Indicators:

The learner:

Yes

No

1. Followed personal safety rules -
2. Followed equipment safety rules -
3. Reviewed procedure for tire removal -
4. Reviewed procedure for tire repair -
5. Removed wheel from unit -
6. Performed soap test to check for rim leaks -
7. Performed water test to determine leak or damaged area -
8. Marked area to be repaired -
9. Deflated and removed tube and tube band -
10. Removed tire from rim -
11. Inspected valve stem - replaced if damaged -
12. Repaired damaged area with appropriate materials -
13. Reassembled unit -
14. Tested for leak -

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing and Repairing Motorcycles		Duty No. 0																
		Task No. 5																
Task: Service wire wheels, using appropriate equipment, to maintain operating condition.																		
Achievement Indicators:	The learner:	<table border="1"> <thead> <tr> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </tbody> </table>	Yes	No	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
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_____	_____																	
1. Followed personal safety rules - 2. Followed equipment safety rules - 3. Reviewed procedure for wheel spoke servicing - 4. Inspected hub for damage - 5. Sound tested each spoke - 6. Replaced bent or damaged spokes - 7. Adjusted individual spokes as required -																		
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																		
Tools and Equipment:	Resources:																	

Duty: Servicing and Repairing Motorcycles		Duty No. 0																																																				
		Task No. 6																																																				
Task: Service drum brakes, using appropriate equipment, to maintain operating condition.																																																						
<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; width: 40%;">Achievement indicators:</th> <th style="text-align: left; width: 30%;">The learner:</th> <th style="text-align: center; width: 15%;">Yes</th> <th style="text-align: center; width: 15%;">No</th> </tr> </thead> <tbody> <tr><td>1. Followed personal safety rules -</td><td></td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>2. Followed equipment safety rules -</td><td></td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>3. Reviewed service procedure for particular model -</td><td></td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>4. Removed wheel -</td><td></td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>5. Disassembled brake unit -</td><td></td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>6. Inspected shoes for wear -</td><td></td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>7. Inspected surface condition of drum - resurfaced if necessary -</td><td></td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>8. Inspected all bearings -</td><td></td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>9. Replaced worn parts as needed -</td><td></td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>10. Reassembled unit -</td><td></td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>11. Adjusted free play or shoe clearance -</td><td></td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>12. Checked for proper operation -</td><td></td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> </tbody> </table>			Achievement indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Followed equipment safety rules -		_____	_____	3. Reviewed service procedure for particular model -		_____	_____	4. Removed wheel -		_____	_____	5. Disassembled brake unit -		_____	_____	6. Inspected shoes for wear -		_____	_____	7. Inspected surface condition of drum - resurfaced if necessary -		_____	_____	8. Inspected all bearings -		_____	_____	9. Replaced worn parts as needed -		_____	_____	10. Reassembled unit -		_____	_____	11. Adjusted free play or shoe clearance -		_____	_____	12. Checked for proper operation -		_____	_____
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																																																						
Tools and Equipment:	Resources:																																																					

Duty: Servicing and Repairing Motorcycles

Duty No. 0

Task No. 7

Task: Service hydraulic brake systems, using appropriate equipment, to maintain operating condition.

Achievement Indicators:	The learner:	Yes	No
1. Followed personal safety rules -		_____	_____
2. Followed equipment safety rules -		_____	_____
3. Secured breakdown for particular model -		_____	_____
4. Inspected system for leaks -		_____	_____
5. Inspected hydraulic oil -		_____	_____
6. Inspected brake shoes or pads -		_____	_____
7. Adjusted "free play" to specifications -		_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Servicing and Repairing Outboards		Duty No. P																																					
		Task No. 1																																					
Task: Perform preseason preparation of outboard engine, using appropriate equipment, to prepare engine for use.																																							
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>3. Removed and inspected spark plug - regapped, if necessary -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>4. Removed oil fill plug and checked oil level -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>5. Checked connections of battery (where applicable) -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>6. Mixed fresh fuel as per manufacturer's specifications -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>7. Tested engine for proper operation -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>8. Inspected water flow from water discharge hole -</td> <td></td> <td>☐</td> <td>☐</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		☐	☐	2. Followed equipment safety rules -		☐	☐	3. Removed and inspected spark plug - regapped, if necessary -		☐	☐	4. Removed oil fill plug and checked oil level -		☐	☐	5. Checked connections of battery (where applicable) -		☐	☐	6. Mixed fresh fuel as per manufacturer's specifications -		☐	☐	7. Tested engine for proper operation -		☐	☐	8. Inspected water flow from water discharge hole -		☐	☐
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Teacher Activities	Student Learning Activities
1. Give handout on pre-season preparation. 2. Provide demonstration on actual lawnmower.	1. Obtain handout on "pre-season preparation". 2. Perform pre-season preparation on lawnmower. 315

Duty: Servicing and Repairing Outboards		Duty No. P																																												
		Task No. 2																																												
Task: Perform midseason service of outboard engine, using appropriate equipment, to maintain operating condition.																																														
Achievement Indicators:	The learner:	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: center; padding: 5px;">Yes</th> <th style="width: 50%; text-align: center; padding: 5px;">No</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> </tbody> </table>	Yes	No	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
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Duty: Servicing and Repairing Outboards	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px 5px;">Duty No.</td> <td style="text-align: center; padding: 2px 5px;">P</td> </tr> <tr> <td style="padding: 2px 5px;">Task No.</td> <td style="text-align: center; padding: 2px 5px;">3</td> </tr> </table>	Duty No.	P	Task No.	3																																																								
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Task: Perform offseason storage service of outboard engine, using appropriate materials, to prevent damage of rust and corrosion.																																																													
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Duty: Servicing and Repairing Outboards		Duty No. P																																									
		Task No. 4																																									
Task: Remove power head of outboard engine, using appropriate equipment, to gain access to engine parts and lower unit.																																											
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>3. Reviewed procedure for removal -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>4. Mounted outboard on engine dolly -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>5. Removed and labeled electrical connections as required -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>6. Removed throttle linkages -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>7. Removed shift linkages -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>8. Removed mounting bolts -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>9. Removed powerhead -</td> <td></td> <td>☐</td> <td>☐</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		☐	☐	2. Followed equipment safety rules -		☐	☐	3. Reviewed procedure for removal -		☐	☐	4. Mounted outboard on engine dolly -		☐	☐	5. Removed and labeled electrical connections as required -		☐	☐	6. Removed throttle linkages -		☐	☐	7. Removed shift linkages -		☐	☐	8. Removed mounting bolts -		☐	☐	9. Removed powerhead -		☐	☐
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Duty: Servicing and Repairing Outboards		Duty No. P																				
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Task: Remove lower unit assembly of outboard, using appropriate equipment, to gain access to internal parts.																						
Achievement Indicators:	The learner:	<table border="1"> <thead> <tr> <th>Yes</th><th>No</th></tr> </thead> <tbody> <tr> <td>_____</td><td>_____</td></tr> <tr> <td>_____</td><td>_____</td></tr> <tr> <td>_____</td><td>_____</td></tr> <tr> <td>_____</td><td>_____</td></tr> <tr> <td>_____</td><td>_____</td></tr> <tr> <td>_____</td><td>_____</td></tr> <tr> <td>_____</td><td>_____</td></tr> <tr> <td>_____</td><td>_____</td></tr> <tr> <td>_____</td><td>_____</td></tr> </tbody> </table>	Yes	No	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
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Duty: Servicing and Repairing Outboards		Duty No. P																																
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Task: Replace water pump impeller of outboard, using appropriate equipment, to restore operating condition.																																		
Achievement Indicators:	The learner:	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: center;">Yes</th> <th style="width: 50%; text-align: center;">No</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> </tbody> </table>	Yes	No	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
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Duty: Servicing and Repairing Outboards		Duty No. P																																																												
		Task No. 7																																																												
Task: Disassemble lower gear box of outboard, using appropriate equipment, to inspect parts for wear and damage.																																																														
Achievement Indicators:	The learner:	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;"></th> <th style="width: 25%; text-align: center;">Yes</th> <th style="width: 25%; text-align: center;">No</th> </tr> </thead> <tbody> <tr><td>1. Followed personal safety rules -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>2. Followed equipment safety rules -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>3. Reviewed disassembly procedure -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>4. Drained oil -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>5. Removed propeller -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>6. Removed and inspected shear pin -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>7. Removed lower gear case cover -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>8. Removed pivot pin -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>9. Removed and inspected shift lever -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>10. Removed and inspected cradle -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>11. Removed and inspected gear assembly -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>12. Removed gears from propeller shaft -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>13. Removed and inspected clutch dog -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>14. Inspected all bearing surfaces -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>15. Inspected all gasket surfaces -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>16. Replaced worn and damaged parts -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>17. Reassembled unit -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>18. Filled with fresh hypoid oil -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>19. Tested unit for proper operation -</td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> </tbody> </table>		Yes	No	1. Followed personal safety rules -	_____	_____	2. Followed equipment safety rules -	_____	_____	3. Reviewed disassembly procedure -	_____	_____	4. Drained oil -	_____	_____	5. Removed propeller -	_____	_____	6. Removed and inspected shear pin -	_____	_____	7. Removed lower gear case cover -	_____	_____	8. Removed pivot pin -	_____	_____	9. Removed and inspected shift lever -	_____	_____	10. Removed and inspected cradle -	_____	_____	11. Removed and inspected gear assembly -	_____	_____	12. Removed gears from propeller shaft -	_____	_____	13. Removed and inspected clutch dog -	_____	_____	14. Inspected all bearing surfaces -	_____	_____	15. Inspected all gasket surfaces -	_____	_____	16. Replaced worn and damaged parts -	_____	_____	17. Reassembled unit -	_____	_____	18. Filled with fresh hypoid oil -	_____	_____	19. Tested unit for proper operation -	_____	_____
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Duty: Performing Engine Related Skills		Duty No. Q																																	
		Task No. 1																																	
Task: Review general mechanics tools, using appropriate methods, to demonstrate a basic knowledge of use.																																			
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>2. Listed tool safety rules for use -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>3. Listed procedure for organization -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>4. Listed procedure for storage -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>5. Listed general tools a mechanic needs -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>6. Listed special power tools -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>7. Listed procedure to clean tools -</td> <td></td> <td>☐</td> <td>☐</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		☐	☐	2. Listed tool safety rules for use -		☐	☐	3. Listed procedure for organization -		☐	☐	4. Listed procedure for storage -		☐	☐	5. Listed general tools a mechanic needs -		☐	☐	6. Listed special power tools -		☐	☐	7. Listed procedure to clean tools -		☐	☐
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																																			
Tools and Equipment:		Resources:																																	

Teacher Activities	Student Learning Activities
1. Assign "ABC's" of Handtools to read. 2. Review tools - class demonstration. 3. Safety rule game. 4. Give test on handtools.	1. Read "ABC's" of Handtools. 2. Listen to demonstration/lecture on hand tools. 3. Play safety rule game. 4. Take test on handtools.

Duty: Performing Engine Related Skills		Duty No. Q																													
		Task No. 2																													
Task: Review soldering, using appropriate materials, to join wires or electrical connections.																															
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Listed types of soldering equipment -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Listed types of solder -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Listed types of fluxes -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Reviewed process of soldering -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Followed equipment safety rules -		_____	_____	3. Listed types of soldering equipment -		_____	_____	4. Listed types of solder -		_____	_____	5. Listed types of fluxes -		_____	_____	6. Reviewed process of soldering -		_____	_____
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																															
Tools and Equipment:		Resources:																													

Duty: Performing Engine Related Skills		Duty No. Q			
		Task No. 3			
Task:					
Review general terms of simple machines, using appropriate materials, to explain each term.					
Achievement Indicators:	The learner:	Yes	No		
1. Reviewed lever -		_____	_____		
2. Reviewed pulley -		_____	_____		
3. Reviewed wheel and axle -		_____	_____		
4. Reviewed inclined plane -		_____	_____		
5. Reviewed screw -		_____	_____		
6. Reviewed mechanical advantage -		_____	_____		
7. Reviewed leverage -		_____	_____		
8. Reviewed force -		_____	_____		
9. Reviewed work -		_____	_____		
10. Reviewed potential energy -		_____	_____		
11. Reviewed kinetic energy -		_____	_____		
12. Reviewed formula for work -		_____	_____		
13. Reviewed gravity -		_____	_____		
14. Reviewed inertia -		_____	_____		
15. Reviewed momentum -		_____	_____		
16. Reviewed resistance -		_____	_____		
17. Reviewed torque -		_____	_____		

Duty: Performing Engine Related Skills	Duty No. Q																																																																																												
Task: Review terms associated with development of power, using appropriate materials, to define each.																																																																																													
<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left; width: 40%;">Achievement Indicators:</th> <th style="text-align: left; width: 30%;">The learner:</th> <th style="text-align: center; width: 10%;">Yes</th> <th style="text-align: center; width: 10%;">No</th> </tr> </thead> <tbody> <tr><td>1. Reviewed combustion -</td><td></td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>2. Reviewed compression -</td><td></td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>3. Reviewed expansion -</td><td></td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>4. Reviewed cycle -</td><td></td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>5. Reviewed displacement -</td><td></td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>6. Reviewed stroke-bore -</td><td></td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>7. Reviewed before top dead center (B.T.D.C.) -</td><td></td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>8. Reviewed top dead center (T.D.C.) -</td><td></td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>9. Reviewed throw -</td><td></td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>10. Reviewed thrust -</td><td></td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>11. Reviewed blow-by -</td><td></td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>12. Reviewed back fire -</td><td></td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>13. Reviewed reciprocating motion -</td><td></td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>14. Reviewed rotary motion -</td><td></td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>15. Reviewed idle -</td><td></td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>16. Reviewed acceleration -</td><td></td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>17. Reviewed load -</td><td></td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>18. Reviewed power -</td><td></td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>19. Reviewed horsepower -</td><td></td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>20. Reviewed lubrication -</td><td></td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>21. Reviewed seizing -</td><td></td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> <tr><td>22. Reviewed knock -</td><td></td><td style="text-align: center;">_____</td><td style="text-align: center;">_____</td></tr> </tbody> </table>		Achievement Indicators:	The learner:	Yes	No	1. Reviewed combustion -		_____	_____	2. Reviewed compression -		_____	_____	3. Reviewed expansion -		_____	_____	4. Reviewed cycle -		_____	_____	5. Reviewed displacement -		_____	_____	6. Reviewed stroke-bore -		_____	_____	7. Reviewed before top dead center (B.T.D.C.) -		_____	_____	8. Reviewed top dead center (T.D.C.) -		_____	_____	9. Reviewed throw -		_____	_____	10. Reviewed thrust -		_____	_____	11. Reviewed blow-by -		_____	_____	12. Reviewed back fire -		_____	_____	13. Reviewed reciprocating motion -		_____	_____	14. Reviewed rotary motion -		_____	_____	15. Reviewed idle -		_____	_____	16. Reviewed acceleration -		_____	_____	17. Reviewed load -		_____	_____	18. Reviewed power -		_____	_____	19. Reviewed horsepower -		_____	_____	20. Reviewed lubrication -		_____	_____	21. Reviewed seizing -		_____	_____	22. Reviewed knock -		_____	_____
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Duty: Performing Engine Related Skills		Duty No. Q																					
		Task No. 5																					
Task: Review the theory of operation of a four-cycle engine, using appropriate materials, to show understanding of operation.																							
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Listed major parts -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Listed functions of major parts -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Listed 4-strokes of internal combustion engine -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Described functions of the four-strokes -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Listed major parts -		_____	_____	2. Listed functions of major parts -		_____	_____	3. Listed 4-strokes of internal combustion engine -		_____	_____	4. Described functions of the four-strokes -		_____	_____
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																							
Tools and Equipment:		Resources:																					
		327																					

Duty: Performing Engine Related Skills**Duty No.** 9**Task No.** 6**Task:** Review horsepower, using appropriate materials, to explain different forms and calculations of each.**Achievement Indicators:**

The learner:

Yes

No

1. Reviewed general horsepower term -
2. Reviewed formula for horsepower -
3. Reviewed brake horsepower -
4. Reviewed indicated horsepower -
5. Reviewed frictional horsepower -
6. Reviewed rated horsepower -
7. Reviewed corrected horsepower -

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:**Resources:**

Duty: Performing Engine Related Skills		Duty No. Q																													
		Task No. 7																													
Task: Review piston, using appropriate materials, to explain operation and functions.																															
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Reviewed function of piston -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Listed parts of piston -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Reviewed styles of pistons -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Reviewed common failures of pistons -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Followed equipment safety rules -		_____	_____	3. Reviewed function of piston -		_____	_____	4. Listed parts of piston -		_____	_____	5. Reviewed styles of pistons -		_____	_____	6. Reviewed common failures of pistons -		_____	_____
Achievement Indicators:	The learner:	Yes	No																												
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Tools and Equipment:	Resources:																														

Duty: Performing Engine Related Skills		Duty No. Q																													
		Task No. 8																													
Task: Reviewed piston rings, using appropriate materials, to explain operation.																															
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Reviewed styles and quantity -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Reviewed inspection procedures -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Reviewed care and service techniques -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Reviewed basic operation -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Followed equipment safety rules -		_____	_____	3. Reviewed styles and quantity -		_____	_____	4. Reviewed inspection procedures -		_____	_____	5. Reviewed care and service techniques -		_____	_____	6. Reviewed basic operation -		_____	_____
Achievement Indicators:	The learner:	Yes	No																												
1. Followed personal safety rules -		_____	_____																												
2. Followed equipment safety rules -		_____	_____																												
3. Reviewed styles and quantity -		_____	_____																												
4. Reviewed inspection procedures -		_____	_____																												
5. Reviewed care and service techniques -		_____	_____																												
6. Reviewed basic operation -		_____	_____																												
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																															
Tools and Equipment:	Resources:																														

Duty: Performing Engine Related Skills		Duty No. Q																													
		Task No. 9																													
Task: Reviewed function of connecting rod, using appropriate materials, to explain operation.																															
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Achievement Indicators:	The learner:	Yes	No																												
1. Followed personal safety rules -		_____	_____																												
2. Followed equipment safety rules -		_____	_____																												
3. Reviewed torque specifications -		_____	_____																												
4. Reviewed match-marks -		_____	_____																												
5. Reviewed connecting rod specifications -		_____	_____																												
6. Reviewed basic functions -		_____	_____																												
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																															
Tools and Equipment:	Resources: 331																														

Duty: Performing Engine Related Skills		Duty No. Q	
		Task No. 10	
Task: Review functions of a cylinder, using appropriate materials, to explain operation.			
Achievement Indicators:	The learner:	Yes	No
1. Followed personal safety rules -		_____	_____
2. Reviewed basic functions of a cylinder -		_____	_____
3. Reviewed servicing procedures -		_____	_____
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.			
Tools and Equipment:	Resources:		

Duty: Performing Engine Related Skills		Duty No. Q												
		Task No. 11												
Task: Review operation of crankshaft, using appropriate materials, to explain functions.														
Achievement Indicators:	The learner:	<table> <tr> <td>Yes</td> <td>No</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </table>	Yes	No	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Yes	No													
_____	_____													
_____	_____													
_____	_____													
_____	_____													
_____	_____													
1. Reviewed personal safety rules - 2. Reviewed basic function - 3. Reviewed "crankshaft throw" - 4. Reviewed journal specifications - 5. Reviewed care and service techniques -														
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.														
Tools and Equipment:	Resources:													
	333													

Duty: Performing Engine Related Skills		Duty No. Q																									
		Task No. 12																									
Task: Review lubrication products, using appropriate materials, to explain operation and functions.																											
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Reviewed A.P.I. code system -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Reviewed S.A.E. code system -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Reviewed viscosity -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Reviewed basic types (four) of lubricants -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Located codes on oil container -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Reviewed A.P.I. code system -		_____	_____	2. Reviewed S.A.E. code system -		_____	_____	3. Reviewed viscosity -		_____	_____	4. Reviewed basic types (four) of lubricants -		_____	_____	5. Located codes on oil container -		_____	_____
Achievement Indicators:	The learner:	Yes	No																								
1. Reviewed A.P.I. code system -		_____	_____																								
2. Reviewed S.A.E. code system -		_____	_____																								
3. Reviewed viscosity -		_____	_____																								
4. Reviewed basic types (four) of lubricants -		_____	_____																								
5. Located codes on oil container -		_____	_____																								
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																											
Tools and Equipment:		Resources:																									

Duty: Performing Engine Related Skills		Duty No. Q										
		Task No. 13										
Task: Review the operation of camshaft using appropriate materials, to explain functions.												
Achievement Indicators:	The learner:	<table border="1"> <thead> <tr> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </tbody> </table>	Yes	No	_____	_____	_____	_____	_____	_____	_____	_____
Yes	No											
_____	_____											
_____	_____											
_____	_____											
_____	_____											
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.												
Tools and Equipment:	Resources:											

Duty: Performing Engine Related Skills		Duty No. Q	
		Task No. 14	
Task: Review camshaft drive gear, using appropriate materials, to explain operation and function.			
Achievement Indicators:		The learner:	
		Yes	No
1. Followed personal safety rules -		_____	_____
2. Followed equipment safety rules -		_____	_____
3. Reviewed functions of camshaft drive gear -		_____	_____
4. Listed parts of camshaft drive gear -		_____	_____
5. Reviewed timing marks location -		_____	_____
6. Reviewed camshaft drive gear failures -		_____	_____
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.			
Tools and Equipment:	Resources:		

Duty: Performing Engine Related Skills		Duty No. 0								
		Task No. 15								
Task: Review valve lifters (tappets), using appropriate materials, to explain operation and functions.										
Achievement Indicators:	The learner:	<table border="1"> <thead> <tr> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </tbody> </table>	Yes	No	_____	_____	_____	_____	_____	_____
Yes	No									
_____	_____									
_____	_____									
_____	_____									
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.										
Tools and Equipment:	Resources:									

Duty: Performing Engine Related Skills		Duty No. Q																													
		Task No. 16																													
Task: Review valves, using appropriate materials, to explain operation and functions.																															
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Reviewed operation of valves (intake and exhaust) -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Listed parts of valve -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Reviewed process for removal and installation -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Reviewed common valve failures -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Followed equipment safety rules -		_____	_____	3. Reviewed operation of valves (intake and exhaust) -		_____	_____	4. Listed parts of valve -		_____	_____	5. Reviewed process for removal and installation -		_____	_____	6. Reviewed common valve failures -		_____	_____
Achievement Indicators:	The learner:	Yes	No																												
1. Followed personal safety rules -		_____	_____																												
2. Followed equipment safety rules -		_____	_____																												
3. Reviewed operation of valves (intake and exhaust) -		_____	_____																												
4. Listed parts of valve -		_____	_____																												
5. Reviewed process for removal and installation -		_____	_____																												
6. Reviewed common valve failures -		_____	_____																												
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																															
Tools and Equipment:	Resources:																														

Duty: Performing Engine Related Skills		Duty No. Q								
		Task No. 17								
Task: Review operation of flywheel, using appropriate materials, to explain functions.										
Achievement Indicators:	The learner:	<table border="1"> <thead> <tr> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </tbody> </table>	Yes	No	_____	_____	_____	_____	_____	_____
Yes	No									
_____	_____									
_____	_____									
_____	_____									
1. Reviewed three basic functions - 2. Reviewed parts of flywheel - 3. Reviewed methods of removal -										
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.										
Tools and Equipment:	Resources:									
	339									

Duty: Performing Engine Related Skills		Duty No. Q																	
		Task No. 18																	
Task: Review operation of intake manifold, using appropriate materials, to explain functions.																			
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Achievement Indicators:	The learner:	Yes	No																
1. Reviewed three basic functions -		_____	_____																
2. Checked gaskets for leaks -		_____	_____																
3. Cleaned using appropriate materials -		_____	_____																
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																			
Tools and Equipment:		Resources:																	

Duty: Performing Engine Related Skills**Duty No.** Q**Task No.** 19**Task:** Locate common physical defects of metal, using appropriate materials, to describe each term.**Achievement Indicators:**

The learner:

Yes

No

1. Located friction points -

2. Located rust (corrosion) -

3. Located pitting -

4. Located scoring -

5. Located burr -

6. Located fracture -

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.**Tools and Equipment:****Resources:**

Duty: Performing Engine Related Skills		Duty No. Q																					
		Task No. 20																					
Task: Review styles of bearings, using appropriate equipment, to select service procedures.																							
<table border="0"> <tr> <td>Achievement Indicators:</td> <td>The learner:</td> <td>Yes</td> <td>No</td> </tr> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Listed types of bearings -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Listed service procedures -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Followed equipment safety rules -		_____	_____	3. Listed types of bearings -		_____	_____	4. Listed service procedures -		_____	_____
Achievement Indicators:	The learner:	Yes	No																				
1. Followed personal safety rules -		_____	_____																				
2. Followed equipment safety rules -		_____	_____																				
3. Listed types of bearings -		_____	_____																				
4. Listed service procedures -		_____	_____																				
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																							
Tools and Equipment:	Resources:																						

Duty: Performing Engine Related Skills

Duty No. Q

Task No. 21

Task: Review procedure for servicing engine seals, using appropriate materials, to restore seals to manufacturer's specifications.

Achievement Indicators:

The learner:

Yes

No

1. Followed personal safety rules -
2. Followed equipment safety rules -
3. Listed tools for servicing -
4. Listed procedure for seal removal -
5. Listed procedure for installation -

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:

Resources:

Duty: Performing Engine Related Skills		Duty No. Q																	
		Task No. 22																	
Task: Review procedure for performing an engine tune-up, using appropriate materials, to return engine to maximum performance.																			
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Listed steps for performing engine tune-up -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		_____	_____	2. Followed equipment safety rules -		_____	_____	3. Listed steps for performing engine tune-up -		_____	_____
Achievement Indicators:	The learner:	Yes	No																
1. Followed personal safety rules -		_____	_____																
2. Followed equipment safety rules -		_____	_____																
3. Listed steps for performing engine tune-up -		_____	_____																
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																			
Tools and Equipment:		Resources:																	

Duty: Performing Engine Related Skills		Duty No. Q																													
		Task No. 23																													
Task: Review basic operation of ignition system, using appropriate materials, to explain basic functions.																															
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Followed personal safety rules -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>2. Followed equipment safety rules -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>3. Listed major parts -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>4. Described internal magneto system -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>5. Described external magneto system -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>6. Described theory of operation -</td> <td></td> <td>☐</td> <td>☐</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Followed personal safety rules -		☐	☐	2. Followed equipment safety rules -		☐	☐	3. Listed major parts -		☐	☐	4. Described internal magneto system -		☐	☐	5. Described external magneto system -		☐	☐	6. Described theory of operation -		☐	☐
Achievement Indicators:	The learner:	Yes	No																												
1. Followed personal safety rules -		☐	☐																												
2. Followed equipment safety rules -		☐	☐																												
3. Listed major parts -		☐	☐																												
4. Described internal magneto system -		☐	☐																												
5. Described external magneto system -		☐	☐																												
6. Described theory of operation -		☐	☐																												
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																															
Tools and Equipment:	Resources:																														

Duty: Performing Engine Related Skills		Duty No. Q	
		Task No. 24	
Task: Review operation of solid state ignition system using appropriate materials, to explain functions and operation.			
Achievement Indicators:	The learner:	Yes	No
1. Reviewed capacitive discharge system (CD) -		_____	_____
2. Listed basic parts of system -		_____	_____
3. Listed advantages of system -		_____	_____
4. Listed disadvantages of system -		_____	_____
5. Reviewed adjustment procedure -		_____	_____
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.			
Tools and Equipment:	Resources:		

Duty: Performing Engine Related Skills		Duty No. Q																									
		Task No. 25																									
Task: Review the operation of breaker points, using appropriate materials, to explain basic functions.																											
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Listed two basic styles -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Listed material contacts -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Listed procedure for checking air gap -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Listed procedure for cleaning -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Described testing procedures:-</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Listed two basic styles -		_____	_____	2. Listed material contacts -		_____	_____	3. Listed procedure for checking air gap -		_____	_____	4. Listed procedure for cleaning -		_____	_____	5. Described testing procedures:-		_____	_____
Achievement Indicators:	The learner:	Yes	No																								
1. Listed two basic styles -		_____	_____																								
2. Listed material contacts -		_____	_____																								
3. Listed procedure for checking air gap -		_____	_____																								
4. Listed procedure for cleaning -		_____	_____																								
5. Described testing procedures:-		_____	_____																								
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																											
Tools and Equipment:		Resources:																									

Duty: Performing Engine Related Skills		Duty No. Q	
		Task No. 26	
Task: Review the operation of magneto, using appropriate materials, to explain basic function.			
Achievement Indicators:	The learner:	Yes	No
1. Listed basic styles -		_____	_____
2. Described theory of operation -		_____	_____
3. Described testing procedure -		_____	_____
4. Described adjustment procedure (where applicable) -		_____	_____
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.			
Tools and Equipment:	Resources:		
348			

Duty: Performing Engine Related Skills		Duty No. Q																	
		Task No. 27																	
Task: Review the operation of condenser, using appropriate materials, to explain basic function.																			
<table border="0"> <tr> <td>Achievement Indicators:</td> <td>The learner:</td> <td>Yes</td> <td>No</td> </tr> <tr> <td>1. Described theory of operation -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Described construction -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Described testing procedure -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </table>				Achievement Indicators:	The learner:	Yes	No	1. Described theory of operation -		_____	_____	2. Described construction -		_____	_____	3. Described testing procedure -		_____	_____
Achievement Indicators:	The learner:	Yes	No																
1. Described theory of operation -		_____	_____																
2. Described construction -		_____	_____																
3. Described testing procedure -		_____	_____																
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																			
Tools and Equipment:	Resources:																		

Duty: Performing Engine Related Skills		Duty No. Q																	
		Task No. 28																	
Task: Review the basic operation of a coil, using appropriate materials, to explain basic functions.																			
<table border="0"> <tr> <td>Achievement Indicators:</td> <td>The learner:</td> <td>Yes</td> <td>No</td> </tr> <tr> <td>1. Listed basic parts of a coil -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Described theory of operation -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Described testing procedure -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </table>				Achievement Indicators:	The learner:	Yes	No	1. Listed basic parts of a coil -		_____	_____	2. Described theory of operation -		_____	_____	3. Described testing procedure -		_____	_____
Achievement Indicators:	The learner:	Yes	No																
1. Listed basic parts of a coil -		_____	_____																
2. Described theory of operation -		_____	_____																
3. Described testing procedure -		_____	_____																
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																			
Tools and Equipment:	Resources:																		

Duty: Performing Engine Related Skills		Duty No. Q														
		Task No. 29														
Task: Review the basic operation of a spark plug, using appropriate materials, to explain basic functions.																
Achievement Indicators:	The learner:	<table border="1"> <thead> <tr> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </tbody> </table>	Yes	No	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Yes	No															
_____	_____															
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_____	_____															
_____	_____															
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																
Tools and Equipment:	Resources:															

Duty: Performing Engine Related Skills		Duty No. Q	
		Task No. 30	
Task: Review general terms of electricity, using appropriate materials, to define each term.			
Achievement Indicators:		The learner:	
		Yes	No
1. Reviewed matter -		_____	_____
2. Reviewed atom -		_____	_____
3. Reviewed electron -		_____	_____
4. Reviewed conductor -		_____	_____
5. Reviewed insulator -		_____	_____
6. Reviewed voltage -		_____	_____
7. Reviewed current -		_____	_____
8. Reviewed resistance -		_____	_____
9. Reviewed circuit -		_____	_____
10. Reviewed short -		_____	_____
11. Reviewed ground -		_____	_____
12. Reviewed open circuit -		_____	_____
13. Reviewed magnetic flux -		_____	_____
14. Reviewed magnetism -		_____	_____
15. Reviewed electromagnetism -		_____	_____
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.			
Tools and Equipment:		Resources:	

Duty: Performing Engine Related Skills		Duty No. Q								
		Task No. 31								
Task: Review wire size, using appropriate materials, to determine correct size for application.										
Achievement Indicators:	The learner:	<table border="1"> <thead> <tr> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </tbody> </table>	Yes	No	_____	_____	_____	_____	_____	_____
Yes	No									
_____	_____									
_____	_____									
_____	_____									
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.										
Tools and Equipment:	Resources:									

Duty: Performing Engine Related Skills		Duty No. Q										
		Task No. 32										
Task: Label parts of a wet cell battery, using appropriate materials, to identify and explain operation.												
Achievement Indicators:	The learner:	<table border="1"> <thead> <tr> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </tbody> </table>	Yes	No	_____	_____	_____	_____	_____	_____	_____	_____
Yes	No											
_____	_____											
_____	_____											
_____	_____											
_____	_____											
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.												
Tools and Equipment:	Resources:											

Duty: Performing Engine Related Skills**Duty No.** Q**Task No.** 33**Task:** Review lubrication systems, using appropriate materials, to explain operation and function.

Achievement Indicators:	The learner:	Yes	No
1. Followed personal safety rules -		_____	_____
2. Followed equipment safety rules -		_____	_____
3. Reviewed three basic styles of systems -		_____	_____
4. Reviewed four functions of a lubrication system -		_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.

Tools and Equipment:**Resources:**

Duty: Performing Engine Related Skills		Duty No. Q																																																					
		Task No. 34																																																					
Task: Review general terms of carburetion, using appropriate materials, to define each term																																																							
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Reviewed states of matter -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>2. Reviewed air composition -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>3. Reviewed gasoline -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>4. Reviewed atomize -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>5. Reviewed vaporize -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>6. Reviewed air-fuel ratio -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>7. Reviewed atmospheric pressure -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>8. Reviewed vacuum -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>9. Reviewed venturi -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>10. Reviewed jet orifice -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>11. Reviewed nozzle -</td> <td></td> <td>☐</td> <td>☐</td> </tr> <tr> <td>12. Reviewed meter -</td> <td></td> <td>☐</td> <td>☐</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Reviewed states of matter -		☐	☐	2. Reviewed air composition -		☐	☐	3. Reviewed gasoline -		☐	☐	4. Reviewed atomize -		☐	☐	5. Reviewed vaporize -		☐	☐	6. Reviewed air-fuel ratio -		☐	☐	7. Reviewed atmospheric pressure -		☐	☐	8. Reviewed vacuum -		☐	☐	9. Reviewed venturi -		☐	☐	10. Reviewed jet orifice -		☐	☐	11. Reviewed nozzle -		☐	☐	12. Reviewed meter -		☐	☐
Achievement Indicators:	The learner:	Yes	No																																																				
1. Reviewed states of matter -		☐	☐																																																				
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																																																							
Tools and Equipment:	Resources:																																																						

Duty: Performing Engine Related Skills		Duty No. Q														
		Task No. 35														
Task: Review gasoline as a fuel, using appropriate materials, to explain its characteristics, properties, and the manufacture of.																
Achievement Indicators:	The learner:	<table border="1"> <thead> <tr> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </tbody> </table>	Yes	No	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Yes	No															
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Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																
Tools and Equipment:	Resources:															
	357															

Duty: Performing Engine Related Skills		Duty No. 00																					
		Task No. 36																					
Task: Review carburetor styles, using appropriate materials, to identify basic characteristics.																							
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Reviewed basic function of a carburetor -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Listed four basic styles -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Listed major characteristics of each of the four basic styles -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Reviewed applications for the four basic styles -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Reviewed basic function of a carburetor -		_____	_____	2. Listed four basic styles -		_____	_____	3. Listed major characteristics of each of the four basic styles -		_____	_____	4. Reviewed applications for the four basic styles -		_____	_____
Achievement Indicators:	The learner:	Yes	No																				
1. Reviewed basic function of a carburetor -		_____	_____																				
2. Listed four basic styles -		_____	_____																				
3. Listed major characteristics of each of the four basic styles -		_____	_____																				
4. Reviewed applications for the four basic styles -		_____	_____																				
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																							
Tools and Equipment:	Resources:																						

Duty: Performing Engine Related Skills		Duty No. Q
		Task No. 37
Task: Review feed systems, using appropriate materials, to explain methods of gasoline delivery to carburetor.		
Achievement Indicators:	The learner:	Yes No
	1. Listed four feed systems -	_____
	2. Described four feed systems -	_____
	3. Reviewed applications of the feed systems -	_____
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.		
Tools and Equipment:	Resources:	

Duty: Performing Engine Related Skills		Duty No. Q																	
		Task No. 38																	
Task: Review basic principles of exhaust systems, using appropriate materials, to explain functions.																			
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Reviewed exhaust stroke cycle -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Reviewed back pressure -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Reviewed function of muffler -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Reviewed exhaust stroke cycle -		_____	_____	2. Reviewed back pressure -		_____	_____	3. Reviewed function of muffler -		_____	_____
Achievement Indicators:	The learner:	Yes	No																
1. Reviewed exhaust stroke cycle -		_____	_____																
2. Reviewed back pressure -		_____	_____																
3. Reviewed function of muffler -		_____	_____																
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																			
Tools and Equipment:	Resources: 360																		

Duty: Performing Engine Related Skills		Duty No. Q	
		Task No. 39	
Task: Review basic principles of air cooling system, using appropriate materials, to explain functions.			
Achievement Indicators:	The learner:	Yes	No
1. Listed basic parts of air cooling system -		_____	_____
2. Reviewed parts of air cooling system -		_____	_____
3. Reviewed heat transfer and dissipation -		_____	_____
4. Listed purpose for maintaining a clean system -		_____	_____
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.			
Tools and Equipment:	Resources:		
361			

Duty: Performing Engine Related Skills		Duty No. Q																																													
		Task No. 40																																													
Task: Review styles of mechanical starters, using appropriate materials, to identify unit.																																															
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Reviewed friction shoe starter -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Reviewed dog type starter -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Reviewed side mounted single gear starter -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Reviewed side mounted multiple gear starter -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Reviewed ratchet starter -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Reviewed impulse starter -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Reviewed remote release impulse starter -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>8. Reviewed side pull rewind starter -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>9. Reviewed vertical pull rewind starter -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>10. Reviewed wind up starter -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Reviewed friction shoe starter -		_____	_____	2. Reviewed dog type starter -		_____	_____	3. Reviewed side mounted single gear starter -		_____	_____	4. Reviewed side mounted multiple gear starter -		_____	_____	5. Reviewed ratchet starter -		_____	_____	6. Reviewed impulse starter -		_____	_____	7. Reviewed remote release impulse starter -		_____	_____	8. Reviewed side pull rewind starter -		_____	_____	9. Reviewed vertical pull rewind starter -		_____	_____	10. Reviewed wind up starter -		_____	_____
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Tools and Equipment:	Resources:																																														

Duty: Performing Engine Related Skills		Duty No. Q																					
		Task No. 41																					
Task: Review theory of operation of a loop-scavenged two-cycle engine, using appropriate materials, to demonstrate an awareness of operation.																							
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Listed major parts -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Described function of major parts -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Described path of fuel flow -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Listed applications -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Listed major parts -		_____	_____	2. Described function of major parts -		_____	_____	3. Described path of fuel flow -		_____	_____	4. Listed applications -		_____	_____
Achievement Indicators:	The learner:	Yes	No																				
1. Listed major parts -		_____	_____																				
2. Described function of major parts -		_____	_____																				
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4. Listed applications -		_____	_____																				
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																							
Tools and Equipment:		Resources:																					

Duty: Performing Engine Related Skills		Duty No. Q																					
		Task No. 42																					
Task: Review theory of operation of a cross-flow two-cycle engine, using appropriate materials, to demonstrate an awareness of operation.																							
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Listed major parts -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Described function of major parts -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Described path of fuel flow -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Listed applications -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Listed major parts -		_____	_____	2. Described function of major parts -		_____	_____	3. Described path of fuel flow -		_____	_____	4. Listed applications -		_____	_____
Achievement Indicators:	The learner:	Yes	No																				
1. Listed major parts -		_____	_____																				
2. Described function of major parts -		_____	_____																				
3. Described path of fuel flow -		_____	_____																				
4. Listed applications -		_____	_____																				
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																							
Tools and Equipment:	Resources:																						

Duty: Performing Engine Related Skills		Duty No. Q													
		Task No. 43													
Task: Compare two-cycle and four-cycle engine, using appropriate materials, to show advantages and disadvantages of each.															
<table border="1"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Listed major characteristics common to both engines -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Constructed a chart to compare each characteristic to both engines -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Listed major characteristics common to both engines -		_____	_____	2. Constructed a chart to compare each characteristic to both engines -		_____	_____
Achievement Indicators:	The learner:	Yes	No												
1. Listed major characteristics common to both engines -		_____	_____												
2. Constructed a chart to compare each characteristic to both engines -		_____	_____												
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.															
Tools and Equipment:	Resources:														

Duty: Performing Engine Related Skills		Duty No. Q																																	
		Task No. 44																																	
Task: Review styles of drive systems, using appropriate materials, to identify and demonstrate an awareness of operation.																																			
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Reviewed friction drive -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Reviewed chain-cog drive -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Reviewed belt drive -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Reviewed transaxles -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Reviewed chain gear box drive -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Reviewed hydrostatic drive -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Reviewed differential drive -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Reviewed friction drive -		_____	_____	2. Reviewed chain-cog drive -		_____	_____	3. Reviewed belt drive -		_____	_____	4. Reviewed transaxles -		_____	_____	5. Reviewed chain gear box drive -		_____	_____	6. Reviewed hydrostatic drive -		_____	_____	7. Reviewed differential drive -		_____	_____
Achievement Indicators:	The learner:	Yes	No																																
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2. Reviewed chain-cog drive -		_____	_____																																
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Tools and Equipment:	Resources:																																		

Duty: Performing Engine Related Skills		Duty No. Q																	
		Task No. 45																	
Task: Review operation of outside micrometer, using appropriate materials, to understand care and usage.																			
<table border="0"> <thead> <tr> <th>Achievement Indicators:</th> <th>The learner:</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1. Reviewed equipment safety rules -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Reviewed basic parts -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Reviewed care and storage -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </tbody> </table>				Achievement Indicators:	The learner:	Yes	No	1. Reviewed equipment safety rules -		_____	_____	2. Reviewed basic parts -		_____	_____	3. Reviewed care and storage -		_____	_____
Achievement Indicators:	The learner:	Yes	No																
1. Reviewed equipment safety rules -		_____	_____																
2. Reviewed basic parts -		_____	_____																
3. Reviewed care and storage -		_____	_____																
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																			
Tools and Equipment:	Resources:																		

Duty: Performing Engine Related Skills		Duty No. 0																		
		Task No. 46																		
Task: Review metric system, using appropriate materials, to compare to English measurement system.																				
Achievement Indicators:	The learner:	<table border="1"> <thead> <tr> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </tbody> </table>	Yes	No	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____	_____
Yes	No																			
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_____	_____																			
1. Reviewed millimeters - 2. Reviewed centimeters - 3. Reviewed meters - 4. Reviewed liters - 5. Reviewed cubic centimeters - 6. Reviewed grams - 7. Reviewed kilograms - 8. Reviewed operations of metric conversion chart -																				
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.																				
Tools and Equipment:	Resources:																			
	368																			

Duty: Performing Engine Related Skills**Duty No.** Q**Task No.** 47**Task:** Review water cooling system of outboard, using appropriate materials, to identify parts, location and functions.**Achievement Indicators:**

The learner:

Yes

No

1. Reviewed general principles of water cooling system -
2. Reviewed component parts -
3. Reviewed functions of components -
4. Reviewed locations of components -

_____	_____
_____	_____
_____	_____
_____	_____

Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.**Tools and Equipment:****Resources:**

Duty: Performing Engine Related Skills		Duty No. Q	
		Task No. 48	
Task: Review theory of operation of a rotary engine, using appropriate materials, to demonstrate an awareness of operation.			
Achievement Indicators:		The learner:	
		Yes	No
1. Listed major parts -		_____	_____
2. Listed functions of major parts -		_____	_____
3. Described the tri-phase operation -		_____	_____
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.			
Tools and Equipment:		Resources:	
		370	

Duty: Performing Engine Related Skills		Duty No. Q								
		Task No. 49								
Task: Review advantages and disadvantages of a rotary engine, using appropriate materials, to determine applications.										
Achievement Indicators:	The learner:	<table border="1"> <thead> <tr> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> </tr> </tbody> </table>	Yes	No	_____	_____	_____	_____	_____	_____
Yes	No									
_____	_____									
_____	_____									
_____	_____									
Criteria: Competence in the task will be recognized when the achievement indicators are successfully performed according to manufacturer's specifications.										
Tools and Equipment:	Resources:									

Duty: Performing Engine Related Skills		Duty No. Q																	
		Task No. 50																	
Task: Review basic parts of a rotary engine, using appropriate materials, to explain basic functions.																			
<table border="0"> <tr> <td>Achievement Indicators:</td> <td>The learner:</td> <td>Yes</td> <td>No</td> </tr> <tr> <td>1. Listed basic parts of rotary engine -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Described function of each part -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Compared parts to four-cycle engine -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </table>				Achievement Indicators:	The learner:	Yes	No	1. Listed basic parts of rotary engine -		_____	_____	2. Described function of each part -		_____	_____	3. Compared parts to four-cycle engine -		_____	_____
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Tools and Equipment:		Resources:																	

Duty: Performing Engine Related Skills		Duty No. Q																																
		Task No. 51																																
Task: Review trouble shooting procedure, using appropriate materials, to locate and isolate malfunction.																																		
<table border="0"> <tr> <td>Achievement Indicators:</td> <td>The learner:</td> <td>Yes</td> <td>No</td> </tr> <tr> <td>1. Reviewed basic engine functions -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>2. Performed a compression check -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>3. Performed a spark check -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>4. Performed a fuel check -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>5. Determined malfunctioning area -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>6. Located malfunctioning part -</td> <td></td> <td>_____</td> <td>_____</td> </tr> <tr> <td>7. Corrected problem and returned engine to service -</td> <td></td> <td>_____</td> <td>_____</td> </tr> </table>			Achievement Indicators:	The learner:	Yes	No	1. Reviewed basic engine functions -		_____	_____	2. Performed a compression check -		_____	_____	3. Performed a spark check -		_____	_____	4. Performed a fuel check -		_____	_____	5. Determined malfunctioning area -		_____	_____	6. Located malfunctioning part -		_____	_____	7. Corrected problem and returned engine to service -		_____	_____
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Tools and Equipment:	Resources:																																	

STUDENT ACHIEVEMENT RECORD

SMALL ENGINE AND
RELATED EQUIPMENT REPAIR

STUDENT _____

INSTRUCTIONS:

Mark each student's level of competence according to the following guide:

<u>LEVEL</u>	<u>GUIDE</u>
1	Student has been exposed to task
2	Task accomplished with assistance
3	Task accomplished to criteria by student
4	Ability to teach or demonstrate the task to others

TASK	LEVEL	DATE
A. PRACTICING SMALL ENGINE SAFETY		
1. Follow personal safety rules.		
2. Follow safety rules on the general job.		
3. Construct a list of personal safety rules.		
4. Follow safety rules.		
5. Follow safety rules for servicing electrical system.		
6. Follow safety rules for ignition system service.		
7. Follow safety rules for servicing the exhaust system.		
B. PRACTICING SHOP RELATED SKILLS		
1. Write up a service order.		
2. Prepare a final bill.		
3. Demonstrate operation of Master Mechanics Manual.		
4. Demonstrate operation of Master Parts Manual.		
5. Consult specification manuals.		

TASK	LEVEL	DATE
B. PRACTICING SHOP RELATED SKILLS (CONTINUED)		
6. Consult parts and time guides.		
7. Operate micro-fiche machine.		
C. USING EMPLOYABILITY SKILLS		
1. Compile an occupational profile.		
2. Analyze a career ladder.		
3. Perform a job search.		
4. Investigate non-wage job characteristics.		
5. Compile a list of personal attributes.		
6. Prepare a resume.		
7. Write a letter of application.		
8. Contact an employer.		
9. Complete a social security form.		
10. Complete a job application.		
11. Interview for a job.		
12. Develop a personal job values chart.		
13. Demonstrate appropriate dress.		
14. Contact the employment interviewer.		
15. Complete forms.		
16. Demonstrate interpersonal skills.		
17. Perform a continuing education program search.		
18. Describe job resignation/dismissal practices.		
D. USING SHOP TOOLS AND EQUIPMENT		
1. Demonstrate use of torque wrench.		
2. Measure thread sizes and styles.		
3. Cut threads with tap.		
4. Cut threads with die.		
5. Draw file a flat surface.		
6. Cut a piece of metal with a hacksaw.		
7. Operate a cold chisel.		
8. Operate ignition analyzer (merc-o-tronic).		
9. Operate a portable tachometer.		

TASK	LEVEL	DATE
D. USING SHOP TOOLS AND EQUIPMENT (CONTINUED)		
10. Operate hand drill.		
11. Operate drill press.		
12. Operate arbor press.		
13. Operate bench grinder.		
14. Operate valve grinder, to grind face of valve.		
15. Operate valve grinder, to grind length of valve.		
16. Operate valve seat refacer.		
17. Operate glass beading cleaner.		
18. Operate power washer.		
19. Operate cylinder boring machine.		
20. Operate dynamometer.		
21. Operate spark plug cleaner/tester.		
22. Remove broken stud.		
23. Set-up oxy-acetylene torch and assemble all components.		
24. Light oxy-acetylene torch.		
25. Join metal by braze welding.		
26. Puddle weld two metal workpieces.		
27. Operate oxy-acetylene torch.		
28. Sweat solder two metal surfaces.		
29. Solder two wires together.		
E. SERVICING AND REPAIRING FOUR-CYCLE ENGINES		
1. Calculate engine displacement.		
2. Calculate compression ratio.		
3. Locate applications of small engines.		
4. Locate engine model and serial number.		
5. Perform compression check.		
6. Interpret compression readings.		
7. Perform cylinder leakage test.		
8. Remove engine.		
9. Prepare engine for disassembly.		
10. Drain engine oil.		

TASK	LEVEL	DATE
E. SERVICING AND REPAIRING FOUR-CYCLE ENGINES (CONTINUED)		
11. Disassemble four-cycle engine.		
12. Clean engine.		
13. Inspect cylinder block.		
14. Inspect piston and rings.		
15. Inspect connecting rod.		
16. Inspect crankshaft.		
17. Inspect fuel system parts.		
18. Inspect valve system parts.		
19. Inspect valve clearance.		
20. Inspect valve lifters.		
21. Inspect camshaft drive gear.		
22. Inspect crankcase breather assembly.		
23. Inspect engine for bent crankshaft.		
24. Reassemble four-cycle engine.		
25. Remove cylinder head.		
26. Install cylinder head.		
27. Remove valves.		
28. Install valves.		
29. Replace valve guides.		
30. Remove flywheel.		
31. Remove crankshaft bearing (ball)		
32. Service governor systems.		
33. Inspect flywheel key.		
34. Lap flywheel.		
35. Ridge ream cylinder.		
36. Bore cylinder.		
37. Hone cylinder.		
38. Remove/install seal.		
39. Perform an engine tune-up.		
40. Prepare engine for storage.		
41. Service exhaust system.		

TASK	LEVEL	DATE
F. SERVICING AND REPAIRING IGNITION SYSTEMS		
1. Diagram ignition system.		
2. Inspect ignition system.		
3. Inspect ignition system parts.		
4. Perform a coil power test.		
5. Perform a coil high speed test.		
6. Perform coil surface insulation test.		
7. Perform coil continuity test.		
8. Perform primary resistance test.		
9. Perform coil ground test.		
10. Check condenser capacity.		
11. Perform condenser leakage and short test.		
12. Perform condenser series resistance test.		
13. Measure resistance of breaker points.		
14. Test spark plug wire.		
15. Inspect ignition timing.		
16. Test ignition timing.		
17. Adjust ignition timing.		
18. Inspect breaker cam.		
19. Inspect breaker plunger.		
20. Replace condenser.		
21. Replace ignition points.		
22. Adjust air gap magneto to flywheel.		
23. Inspect condition of spark plugs.		
24. Clean spark plugs.		
25. Gap spark plugs.		
26. Replace spark plugs.		
G. SERVICING AND REPAIRING ELECTRICAL SYSTEMS		
1. Solve equations involving Ohm's Law.		
2. Locate electrical symbols.		
3. Wire a series circuit.		
4. Wire a parallel circuit.		
5. Replace light bulbs.		

TASK	LEVEL	DATE
G. SERVICING AND REPAIRING ELECTRICAL SYSTEMS (CONTINUED)		
6. Replace bulb sockets.		
7. Test switches.		
8. Replace switches.		
9. Test fuses.		
10. Replace fuses.		
11. Construct a circuit with a fuse.		
12. Construct a circuit with an ammeter.		
13. Construct a circuit with a switch.		
14. Bypass a switch.		
15. Test battery.		
16. Test battery electrolyte level.		
17. Test battery voltage.		
18. Test battery capacity (load).		
19. Test battery for surface leakage.		
20. Charge battery.		
21. Clean battery post and cable connections.		
22. Replace battery cables.		
23. Replace instrument gauges.		
24. Replace constant voltage regulator.		
25. Measure voltage in a circuit.		
26. Measure resistance of circuit.		
27. Test ground system resistance.		
28. Test charging system output.		
29. Test constant voltage regulator.		
30. Test instrument gauges.		
31. Adjust voltage regulator.		
H. SERVICING AND REPAIRING LUBRICATING SYSTEMS		
1. Locate oil A.P.I. and S.A.E. codes.		
2. Change engine oil.		
I. SERVICING AND REPAIRING FUEL SYSTEMS		
1. Follow safety precautions for gasoline.		

TASK	LEVEL	DATE
I. SERVICING AND REPAIRING FUEL SYSTEMS (CONTINUED)		
2. Disassemble a horizontal float feed carburetor.		
3. Assemble a horizontal float feed carburetor.		
4. Disassemble suction feed carburetor.		
5. Assemble suction feed carburetor.		
6. Disassemble diaphragm carburetor.		
7. Assemble diaphragm carburetor.		
8. Rebuild carburetor.		
9. Clean carburetor air cleaner.		
10. Test fuel pump.		
11. Adjust automatic choke.		
J. SERVICING AND REPAIRING COOLING SYSTEMS		
1. Remove blower housing.		
2. Service air cooling system.		
K. SERVICING AND REPAIRING STARTING SYSTEMS		
1. Inspect recoil starter.		
2. Remove recoil assembly.		
3. Install rope in recoil.		
4. Replace recoil spring.		
5. Service Briggs and Stratton starter clutch.		
6. Check operation of electric starters.		
7. Test starter control circuit.		
8. Test starter current draw.		
9. Replace starter solenoid.		
10. Replace starter.		
L. SERVICING AND REPAIRING TWO-CYCLE ENGINES		
1. Disassemble two-cycle engines.		
2. Inspect reed valve.		
3. Inspect rotary valve.		
4. Reassemble two-cycle engine		
5. Mix fuel supply.		

TASK	LEVEL	DATE
L. SERVICING AND REPAIRING TWO-CYCLE ENGINES (CONTINUED)		
6. Pressure test engine crankcase.		
M. SERVICING GENERAL EQUIPMENT SERVICE		
1. Service auxiliary drive units.		
2. Service differential.		
3. Service lawnmower blade.		
4. Service rotary mower body.		
5. Adjust throttle control.		
6. Service riding mower front axle.		
7. Adjust band axle brakes.		
8. Adjust clutch linkage.		
9. Service roto-tiller tines.		
10. Service roto-tiller gear box.		
11. Service gas powered lawn edger.		
12. Remove chain saw.		
13. Adjust chain saw tension.		
14. Inspect chain saw bar.		
15. Service chain saw clutch.		
16. Sharpen chain saw.		
17. Service snowmobile track.		
18. Service torque convertor of snowmobile.		
19. Service snowmobile skis.		
20. Review designs of snow throwers.		
21. Service snow thrower.		
22. Repack wheel bearings.		
23. Jump start a machine with a dead battery.		
24. Service weed eater.		
25. Service micro-safety switches.		
26. Service blade brake mechanisms.		

TASK	LEVEL	DATE
N. PRACTISING MEASUREMENT		
1. Demonstrate measuring skills, to determine size to the nearest 1/16 of an inch.		
2. Demonstrate measuring skills, to measure outside dimensions within .001.		
3. Demonstrate measuring skills, to measure several selected pieces of metal to within .001 of an inch.		
4. Demonstrate measuring skills, to measure bore of a cylinder within .001 of an inch.		
5. Demonstrate measuring skills, to measure the depth of a recessed surface to within .001.		
6. Demonstrate measuring skills, to measure piston travel.		
7. Demonstrate measuring skills, to measure "run out" of a centered object.		
8. Demonstrate measuring skills, to measure the bore of a cylinder.		
O. SERVICING AND REPAIRING MOTORCYCLES		
1. Service "wet clutch".		
2. Service front suspension.		
3. Service chain.		
4. Service tire.		
5. Service wire wheels.		
6. Service drum brakes.		
7. Service hydraulic brake systems.		
P. SERVICING AND REPAIRING OUTBOARDS		
1. Perform pre-season preparation of outboard engine.		
2. Perform mid-season service of outboard engine.		
3. Perform off-season storage service of outboard engine.		
4. Remove power head of outboard engine.		
5. Remove lower unit assembly of outboard.		
6. Replace water pump impeller of outboard.		

TASK	LEVEL	DATE
P. SERVICING AND REPAIRING OUTBOARDS (CONTINUED)		
7. Disassemble lower gear box of outboard.		
Q. PERFORMING ENGINE RELATED SKILLS		
1. Review general mechanics tools.		
2. Review soldering.		
3. Review general terms of simple machines.		
4. Review terms associated with development of power.		
5. Review the theory of operation of a four-cycle engine.		
6. Review horsepower.		
7. Review piston.		
8. Review piston rings.		
9. Review function of connecting rod.		
10. Review functions of a cylinder.		
11. Review operation of a crankshaft.		
12. Review lubrication system.		
13. Review the operation of camshaft.		
14. Review camshaft drive gear.		
15. Review valve lifters (tappets).		
16. Review valves.		
17. Review operation of flywheel.		
18. Review operation of intake manifold.		
19. Locate common physical defects of metal.		
20. Review styles of bearings.		
21. Review procedure for servicing engine seals.		
22. Review procedure for performing an engine tune-up.		
23. Review basic operation of ignition system.		
24. Review operation of solid state ignition system.		
25. Review the operation of breaker points.		
26. Review the operation of megneto.		
27. Review the operation of condensor.		
28. Review the basic operation of a coil.		
29. Review the basic operation of a spark plug.		

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TOOL/EQUIPMENT LIST UNDER \$300

Open/box wrench set $\frac{1}{4}$ " to 1 $\frac{1}{16}$ "	Wire feeler gauges
Open/box wrench set metric 7mm to 21 mm	Compression gauges
Valve spring compressor	Cylinder leakage tester
Adjustable wrenches	Hacksaws
Pipe wrenches	Scrapers
Point spring compressor	$\frac{3}{8}$ " drive metric socket set
Flywheel holder - Tecumseh	$\frac{3}{8}$ " drive metric deep well sockets
Flywheel holder - Briggs	Ridge reamer
Starter clutch holder	Cylinder hone
Screwdrivers	Wire brushes
Chisel and punch kit	Assorted files
Offset screwdriver set	File brush
Needle nose pliers	Wire strippers
Slip joint pliers	C-clamps
Diagonal pliers	Oil can
Plastic hammers	Drill bits $\frac{1}{16}$ " to $\frac{5}{8}$ "
Rubber hammers	Electric hand drill $\frac{3}{8}$ " chuck
Ballpeen hammers	Tool engraver/marker
Torque wrench - foot lbs.	Battery service kit
Torque wrench - inch lbs.	Eye protection devices
Wheel puller set	
Briggs flywheel puller set	
Piston ring compressors	
Piston ring expanders	
Vise grips	
Breaker bar $\frac{1}{2}$ " drive	
$\frac{3}{8}$ " drive socket set	
$\frac{1}{4}$ " drive socket set	
$\frac{1}{2}$ " drive socket set	
$\frac{3}{8}$ " deep well socket set	
$\frac{1}{2}$ " deep well socket set	
Nut driver set	
Funnel	
Oil spout	
Flat feeler gauges	

RECOMMENDED EQUIPMENT LIST

SMALL ENGINE REPAIR

<u>ITEM #</u>	<u>QUANTITY</u>	<u>ITEM DESCRIPTION</u>
1	1	Air Compressor - With Air Dryer
2	1	Arc Welder
3	1	Battery Charger and Tester
4	1	Bench Press, Manual or Hydraulic. W/Accessories
5	1	Boring Bar-Portable Honing - With Stand
6	1	Cold Solvent Cleaning Tank, Air Agitated
7	1	Drill Press, 15" W/Accessories
8	1	Engine Lathe, 10" Bench Type Minimum
9	1	Flammable Materials Storage Cabinet - OSHA Approved
10	1	Glass Bead Cabinet
11	1	Grinder, 7" Minimum, W/Accessories
12	1 Set	Hand Tools Group - Wrenches, Drives, Sockets (Metric * U.S.) (Master Instruction Set)
13	1 Set	Hand Tools, (Student - Metric and U.S.)
14	1	Hot Solvent Cleaning Tank
15	1	Magneto Tester
16	1 Set	Master Thread Repair Kits (Metric and U.S.)
17	1 Set	Micrometers, Inside and Outside
18	1	Mobile Hydraulic Floor Crane
19	2	Outboard Engine Dollies
20	1	Outboard Engine Test Tank, W/Bloom and Power Exhaust
21	4	Outboard Motor Repair Stands
22	1 Unit	Oxy-Acetylene Welding Unit
23	1 Set	Power Tools (Impact Wrenches) - Air or Electric
24	1	Pressure Washer (Hot and Cold)
25	1 Set	Puller - Remover Set, Completer
26	1	Small Engine Dynamometer
27	12	Small Engine Stands
28	3	Small Engine Test Stands (Capable of Running Engine)
29	1	Snowmobile Dolly
30	1 Set	Special Tools and Accessories Group - Small Engines
31	5	Stock Carts
32	1	Tach-Dwell Tester
33	2	Timing Set for Two Cycle Engines
34	1	Valve Refacer with Reseater, Small Engine
35	1	Volt-OHM-Ammeter
36	10	Workbenches W/Vic, Metal, 6'
37	1	Micro-Fische Reader
38	1	Safety Glasses Storage Cabinet W/Ultra Violet Light
39	1	Chain Saw Sharpner with Equipment
40	1	Valve Seat Cutter with Equipment
41	1	Valve Guide Repair Kit
42	1	Bearing Service Kit
43	1	Belt/Disc Grinder
44	1	Unload Ramp
45	1	Hydraulic Work Table

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